Gas Air Conditioners–Report From the Field *Pg. 13*

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I-B-R Stresses Need for Unity In Hydronics

ABSECON, N. J. — The importance of unity of effort of all levels of the hydronics industry was stressed at the recent semiannual meeting of The Institute of Boiler & Radiator Manufacturers.

The chairman, D. J. Quinn, vice president-sales, Plumbing & Heating Div., American-Standard, stated that in planning this meeting, the objective of cohesion of all segments of the industry had been paramount in the minds of the officers and management of the institute.

R. E. Ferry, general manager, highlighted the theme of the first session in a talk entitled, "The Symbolism of I-B-R." He stated:

"Over a period of years the letters I B R have become symbolic—Integrity Building Respect. This symbolism of I-B-R can and will in the future make this industry move forward at

(Continued on Back Page, Col. 1)

Public Relations, Registration Law Concern Engineers

By Frank J. Versagi

PITTSBURGH — Consulting engineers have problems. Most of the problems can be eliminated by intelligent public relations activity on the part of the consulting engineers themselves.

These thoughts summarize the opinions offered by the Board of Directors of the Consulting Engineers Council which met for three days here recently. The semiannual meeting was attended by directors and alternates of some 30 member associations of consulting engineers.

Of great concern to the CEC is the recently revised "Model Engineering Registration Law" officially recommended in August by the National Council of State Boards of Engineering Examiners. The CEC especially takes exception to that portion of the model law which upholds what the consulting engineers call *corporate practice.*

Corporate practice is the term used to specify the offering of consulting services by a firm whose principals are not themselves registered engineers and consultants. Several directors reported that their states now allow such engineering practice by firms.

It is the firm position of

(Continued on Page 10, Col. 1)

ASHRAE Sets Program For Chicago Meeting

CHICAGO—A series of four technical sessions, five symposiums, conferences, forums, and committee meetings are planned for the semiannual meeting of the American Society of Heating, Refrigerating

(Continued on Page 4, Col. 5)

USERS REPORT on Cooling, Refrigeration

What do users of air conditioning and refrigeration equipment think about their purchases?

What is their reaction to industry design, application, and installation practices?

In preparation for the series of articles beginning in this issue, the NEWS has interviewed organizations who have experience with hundreds of systems and who have recorded their experience one way or another.

The first group of articles will offer the viewpoints of food supermarket chain store organizations. An interview with E. E. Collins, mechanical engineer for Safeway Stores, begins on page 16.

A major part of the series will be a study-in-depth of a 107-store chain: factors involved in equipment selection; the ratio of construction cost going for air conditioning and refrigeration; the number of service calls required by the 107 stores in a year. All this collected and analyzed by a NEWS editor from records kept and verified by the food chain.

Promoting Industry Products, Greater Profit To Be Objectives of ARI Program for 1961

FOR A JOB WELL DONE, Rudy Berg (left), Copeland Refrigeration Corp. vice president and retiring president of the Air-Conditioning & Refrigeration Institute, receives a special plaque from Ray K. Serfass, manager, Westinghouse Air Conditioning Div., newly elected head of ARI. Berg may go down in history as having served the longest term of any ARI president, since he steered the association through an organizational change, holding office since May, 1959.

By Phil B. Redeker

HOLLYWOOD BEACH, Fla. —Training its sights on a program of objectives emphasizing greater profitability for all segments of the industry, and a more intensive promotion of the benefits of air conditioning and refrigeration to the buying public, the Air-Conditioning & Refrigeration Institute marked the start of a new year of activity at its annual meeting here.

R. K. Serfass, manager of Westinghouse Electric Corp.'s Air Conditioning Div. and new ARI president, outlined the new objectives in his inaugural address, and also emphasized that certain other objectives previously set forth—particularly the certification program, now being expanded to include heat pumps—would be vigorously pursued.

Another new objective which may be significant to the industry's future course is that of "consolidation with other trade associations in an industry to reduce over-all costs to individual companies by eliminating duplication of effort."

It was perhaps significant that Serfass in his address placed stress on the "financial objectives of ARI" (including the idea of consolidation) this seems to reflect the industry's concern with dwindling profit margins.

The other financial objectives "approved by the executive com-

(Continued on Page 21, Col. 1)

Generals, Architects

Rally To Support Single Contract System

PHOENIX, Ariz.—To combat growing agitation among mechanical contractor groups for separate mechanical contracts, the governing and advisory board of the Associated General Contractors recently made three moves in support of the single contract system.

1. It announced plans to issue a brochure extolling the virtues of the single contract system.

2. It met with top officials of the American Institute of Architects and won agreement that architects and general contractors must work closely together and continue their traditional relationship to meet growing demands for more comprehensive service to the building owner.

(Continued on Page 21, Col. 5)

Outside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Hits of the Show

Aboard the *S.S. Hanseatic* during ARW's Convention and Educational Seminar, the two passengers who had the most fun were Ernie Tramposh's two-year-old son and Charlie Koopman's nine-year-old daughter.

And to the rest of the passengers, these wonderful children provided the finest entertainment on the cruise.

Ernie's rugged little boy is destined to be a battering-ram fullback and "Dope" hopes he goes to the University of Illinois.

Red-haired Victoria Koopman was everywhere, and everywhere she was a joy. She led the band, she led the waiter's parade around the dining salon, she led the shore exploration parties.

And at night, in the intimate "little club" on the *Hanseatic,* she sang and played the piano as the best part of the floor show.

These two personality kids are headed for stardom of one sort or another.

Veddy British and a Mild Cup of Tea

Compared to exciting Haiti, the isle of Jamaica was a tame pussy cat.

Doubt if any of the ARW conventioneers will want to go there again.

In contrast, all the ARWers want to revisit Haiti. (Incidentally, this was the fourth sojourn in Haiti for Dunham-Bush's "Red" Mulcahey and his lovely bride, Patricia.)

So, the remainder of this "Outside Dope" will be factual about Jamaica, rather than lyrical. We'll let the "Candid Corner" snapshots provide the "color."

Jamaica was discovered in 1494 by Christopher Columbus; settled by Africans; and captured by the British in 1655. It has remained a British territory ever since.

It is a land of mighty mountains with pregnant plains. Also it is the melting pot of the Carib-

(Continued on Page 8, Col. 1)

AGA Sponsors Gas Air Conditioning School Dec. 5-9

COLUMBUS, Ohio — A Gas Air Conditioning Sales School sponsored by the American Gas Association will be staged Dec. 5-9 at the Nationwide Inn (air conditioned by gas, naturally) here.

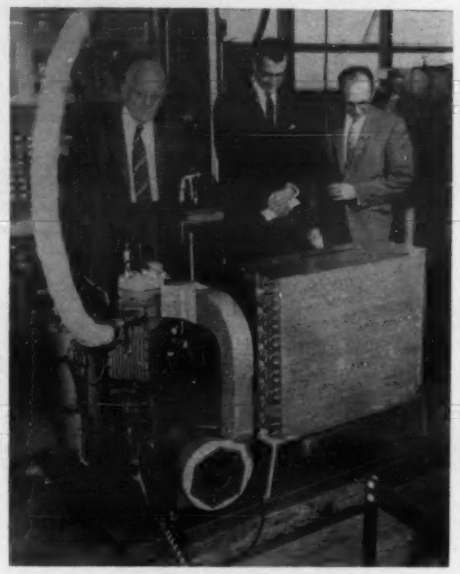
The course is designed to provide the technical and sales aspects of gas air conditioning to help meet the need for training salesmen in this field.

Enrollment, limited to 150, is open to employes of gas equipment manufacturers and dealers, gas companies, and present and prospective gas customers. Tuition fee is $55. Enrollment closes Dec. 1.

A complete reference text, dealing with all subjects included in the course, will be presented to each student for use during the course and for later

(Continued on Page 11, Col. 4)

Robertshaw Opens Research Center



A RESEARCH MODEL of the Free Piston Refrigerant Compressor, which will provide air conditioning by means of natural gas, draws the attention of these visitors to the official opening of Robertshaw-Fulton's new Eastern Research Center in King of Prussia, Pa. The compressor, a project of the Battelle Memorial Institute and the American Gas Association, is being developed by Robertshaw under an exclusive licensing agreement. More than 200 guests attended the opening of the center, located in suburban Philadelphia.

Airtemp To Make Dodge, Plymouth Heaters

DAYTON — Automobile heaters for the Plymouth and Dodge passenger cars will be manufactured here by Chrysler Corp.'s Airtemp Div. beginning next July.

Thomas W. Kirby, vice president-marketing, said the new line of heaters will mean approximately 200 more jobs at Chrysler's Dayton plant. The plant is already one of the city's largest employers with approximately 1,700 persons.

Kirby pointed out that the July production date for the heaters coincided with Chrysler's 25th anniversary in Dayton.

This is the first time Chrysler Airtemp has manufactured individual automobile heating units.

Buffalo Silver Shield Launching

PRESENT at the launching of another Indoor Comfort Bureau to sell Silver Shield Systems are, left to right: Jack Allen, Buffalo wholesaler, one of the founding fathers of the Indoor Comfort Bureau of Western New York; Randall A. Nelson, director of public relations of the National Warm Air Heating & Air Conditioning Association; Ed Kinkel, chairman of the program committee for the inaugural dinner; James D. Nolan, assistant director of public relations of the association; and Greogory Demakos, chairman of the educational committee that supervised the 12-week technical training program given by the new bureau.

* * *

To License Tulsa Indoor Comfort Bureau

TULSA, Okla.—Upwards of 500 individuals are expected to be present to participate in the official licensing of the Tulsa Indoor Comfort Bureau here at a dinner-meeting at the Mayo hotel on Tuesday evening, Nov. 29.

Featured speaker at the launching will be Senator Robert S. Kerr of Oklahoma. Also on the program will be Mayor James L. Maxwell, who has proclaimed the week of Nov. 27 through Dec. 3 as "Silver Shield Week."

The Tulsa bureau will be licensed at the civic banquet by the National Warm Air Heating & Air Conditioning Association. Representing the association in the presentation of the license will be Charles H. Franke, president of the American Furnace Co., St. Louis, and a member of the board of trustees of the national association.

Others on the program will include a representative of the Tulsa Chamber of Commerce and Cheston S. Heath, executive director of the Tulsa Better Business Bureau.

Representatives of the Oklahoma Natural Gas Co. and Public Service Co. of Oklahoma will also speak. Both utilities are associate members of the new bureau, the first in the state of Oklahoma and the nation's 12th bureau.

Approximately 40 heating men from the area who attended a 12-week technical training course to qualify for membership in the bureau will receive certificates of eligibility.

Officers of the new bureau are: Richard Shoemaker, Forrest Shoemaker Air Conditioning Co., president; Jack Harper, Harper's Sheet Metal Co., vice president; Robert E. Saizow, Climate Control Co., secretary; and James L. Sharp, Sharp Refrigeration & Air Conditioning Co., treasurer.

Active members of the bureau are: J. D. McGehee, Air-Trol Co.; John Von Gonten, Comfort of Tulsa, Inc.; C. W. Hessmer, Hessmer-Tulsa Co.; Ray M. Conners, Home Air Conditioning Co.; W. B. Gann, Home Furnace Co.; J. L. Trantham, Mid-West Sheet Metal Co.; Orval Ray Gilleland, Sigler, Inc.; Lloyd West, West Air Conditioning Co.; and Elmer Wright, Wright Heating & Air Conditioning.

Active associate members are: A. L. Kimmel, American Furnace Co.; Archer-Hinman Supply Co.; Cooper Supply; Oklahoma Natural Gas Co.; Palmer Supply; John Zink Co.; Arkla Servel; and Public Service Co. of Oklahoma.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

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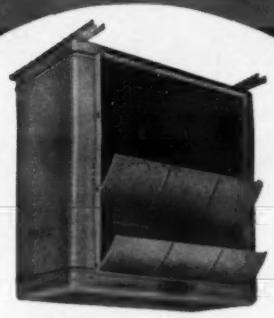
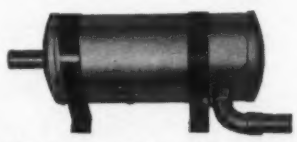
A NEW AUTOMATIC HOT GAS DEFROST SYSTEM

for applications where
LOW FIRST COST
is the major consideration



One fan evaporator with heat exchanger



Metering accumulator with brackets

If low first cost is the major factor, the new Kramer THAW SYSTEM offers more than any competitive system. (For sharp freezing loads, or where compressor is outdoors, Thermobank is recommended.)

- No compressor overloading with hold-back valve.
- Faster defrosting because more heat is available.
- Positively cuts liquid return to the compressor.
- Has the largest liquid accumulator.
- Foolproof metering device.
- No clogging with removable strainer.
- Oil problems eliminated by gravity drain.
- No unnecessary defrost cycles.
- Heated copper drain pan.
- Double pan to protect heating coil.
- Aluminum casing on evaporator.

Removable Strainer

Timer

Hot Gas Solenoid Valve

Hold-Back Valve

Hot Gas Strainer

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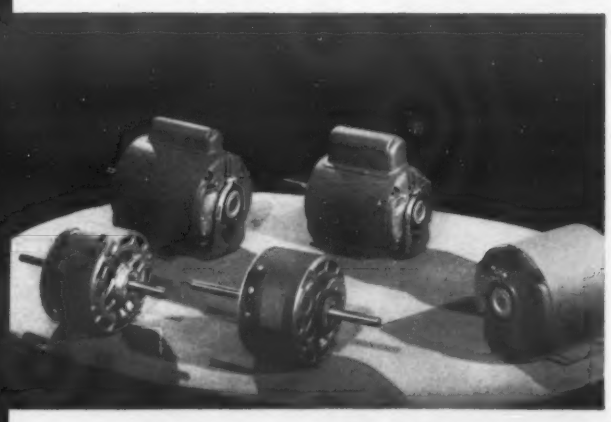
AFTER 3 YRS NORMAL OR 1 YR HEAVY DUTY SERVICE ADD OIL ANNUALLY. NO RE-OILING NORMALLY REQUIRED FOR LIGHT DUTY WITH TOTAL OPERATING TIME UNDER 5,000 HRS. USE ELECTRIC TOR OR SAE 10 OIL.
NOT OVER OIL.
TO DISASSEMBLE OR REMOVE BEARING CAP ON TERMINAL THEN REMOVE SHAFT BY RELEASING TAB.

A MOTOR IS A MOTOR **EXCEPT . . .**

You get MORE THAN A MOTOR when you buy General Electric fhp motors



Select your motor needs from General Electric's complete line, specifically designed for belt- or direct-drive applications. Premium quality General Electric fractional-hp motors build customer satisfaction and help increase your sales.

Here's why: Everyone thinks of motors as commonplace machinery and many say "they're practically all alike" . . . a motor is a motor. But, when extra-value features are added . . . features that cut installation and maintenance time and give more reliable service . . . you get more than a motor!

For original equipment or for replacement, General Electric offers added values in its motors for your heating and air conditioning equipment. These features mean "premium quality" motors for your customers, giving top performance and satisfaction.

And when you add the importance to your business of General Electric's fast sample service and expert application aid . . . prompt delivery and complete line availability . . . you can see why you get MORE THAN A MOTOR when you buy G-E fhp motors.

For information or help on fhp motor application or replacement problems, call your General Electric Sales Office where a Form G motor expert is ready to serve you. Write for bulletins GEA-6424 and GEA-6533, General Electric Co., Section 738-03, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

American-Standard

Acquires Rochester Mfg. Co., Detroit Controls To Operate It

ROCHESTER, N. Y. — Acquisition of Rochester Mfg. Co., Inc. here by American Radiator & Standard Sanitary Corp. was announced recently.

The Rochester company will now be operated as a part of the Detroit Controls Div. of American-Standard which maintains headquarters in Detroit.

American - Standard acquired Rochester Mfg. in exchange for about 125,000 shares of common stock.

F. J. Kreissl

C. L. Hastings

Rochester Mfg., formed in 1915 to make fuel gauges for automobiles, is a leading producer of liquid level, pressure, and temperature indication gauges and instruments used in a number of important industries.

The company, which supplies gauges and instruments as component parts for producers of farm and industrial engines and other original equipment manufacturers, also makes such military products as magazines for the Springfield M-14 rifle and thermometers for the U. S. Navy's atomic submarines.

The firm presently employs over 350 persons. Its sales volume approximately $5-million.

Detroit Controls, whose operations date back to 1877, is a major manufacturer of flow control devices, industrial valves, electronic precision instruments, and automatic controls having diverse application in the transportation, heating, air conditioning, refrigeration, appliance, atomic power, aircraft, and missile fields, among others.

The division has plants at Detroit and Stratford, Conn.

Included in the acquisition is Rochester Mfg. Co. of California, Monrovia, Los Angeles County, purchased in 1956. This plant produces high-pressure gauges for missiles and military aircraft.

An office-warehouse operation, established in 1945, in Chicago, serves as a supply source for the midwest.

"Addition of Rochester Mfg. to Detroit Controls marks a significant step forward in our long-term growth and diversification program geared to serve industry more effectively," F. J. Kreissl, president of Detroit Controls, declared.

"It will enable us to broaden our manufacturing and marketing activities more rapidly in the field of industrial instrumentation."

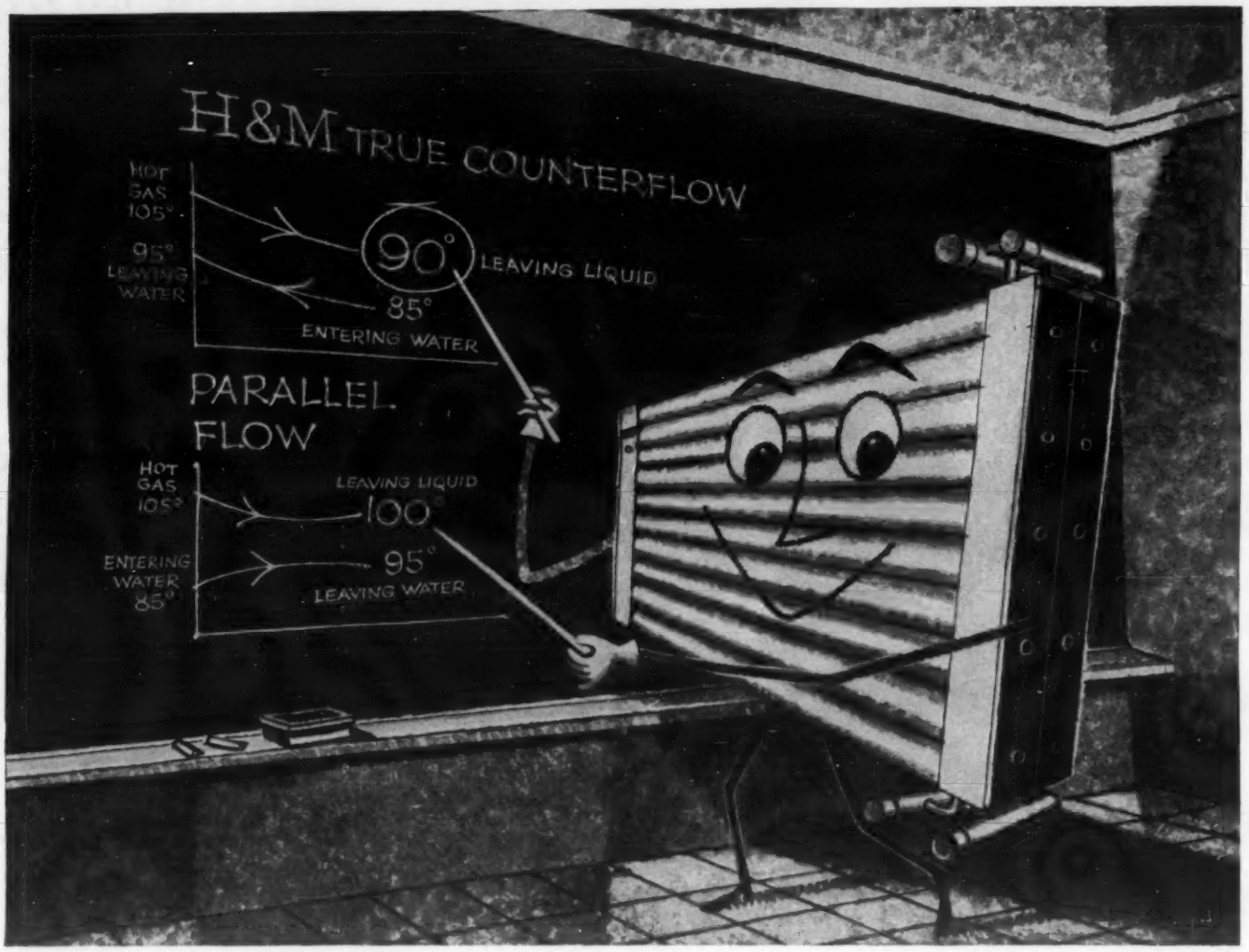
C. L. Hastings, president of Rochester Mfg., stated that "Detroit Controls' research, development, and financial management capabilities and resources will substantially implement Rochester Mfg.'s efforts in these important areas."

Hastings will become a vice president of Detroit Controls with full-division-line responsibility. His immediate assignment in this connection, Kreissl said, will be to "coordinate and expedite the smooth integration of Rochester Mfg.'s facilities, products, manufacturing, and marketing activities into the Detroit Controls organization."

It was also announced that Warren W. Hastings, since 1948 vice president of manufacturing and engineering for RMC, will continue to manage production operations at the Rochester plants.

While no other changes in personnel or policies at Rochester are presently contemplated, Kreissl said that Detroit Controls plans to transfer the manufacture of its line of "TyniSwitch" precision snap-acting switches from the company's Stratford plant to Rochester as quickly as possible.

"We're planning this move," he commented, "to take advantage of RMC's well-recognized instrument-making talents and facilities."



BEFORE YOU BUY, THINK:

Will you get adequate subcooling from your condenser?

You will if it's an H&M water-cooled condenser with true counterflow heat exchange

In Halstead & Mitchell water-cooled condensers the refrigerant and cooling water are introduced in true counterflow, as shown in the chart. Test results indicate an average of 15 degrees of subcooling in H&M condensers. Liquid refrigerant leaves at a lower temperature and system capacity is increased about ½% for each degree of subcooling without additional power input.

H&M condensers feature double-tube design, seamless copper tubing, brass headers. End plates are easily removed for quick, safe, *mechanical* cleaning. Water tubes are generously sized for low pressure drop and minimum maintenance. Available in ⅓ to 25 ton capacities, condenser types are Standard (½" and ⅝" O.D. water tubes), Heavy Duty (⅝" O.D. water tubes), and Sea Water (⅝" O.D. cupro-nickel water tubes), and are U/L approved. Order them from your refrigeration wholesaler and use them singly or on racks. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

H&M WATER-COOLED CONDENSER WITH TRUE COUNTERFLOW

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Water-Cooled Condensers • Cooling Towers • Air-Cooled Condensers • Finned Coil Products

RAPSCO Annexes New San Francisco Outlet

SAN FRANCISCO — A. F. Tudury, president of Refrigerating & Power Specialties Co., has announced the acquisition of Acme Supply Co. of Sacramento from Louis Dickens, president of Acme Supply Co. of Reno, Nev.

The Sacramento organization will henceforth be known as Acme Refrigeration Supply, Div. of Refrigerating & Power Specialties Co. Acme Refrigeration Supply will be manned by the same crew under managership of Virgil Kozlowski.

Tudury said there will be immediate enlargement of Sacramento store facilities, merchandise carried in stock, and an increase in available lines of equipment.

Eight other RAPSCO stores are located in San Francisco, Oakland, Stockton, Fresno, Portland, Tacoma, and Seattle.

ASHRAE--

(Continued from Page 1, Col. 2)

& Air-Conditioning Engineers to be held at the Conrad Hilton hotel here Feb. 13-16, the group has announced.

"The program has been carefully designed to capture the interest of all segments of ASHRAE," the announcement said.

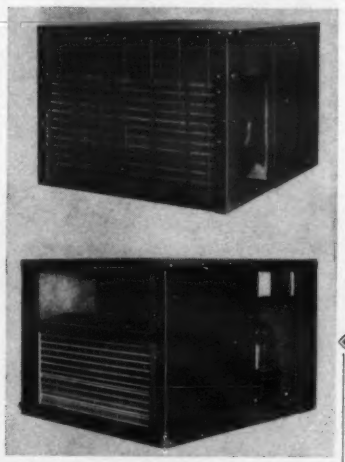
"The daily technical sessions and symposiums, covering such subjects as combustion, insulation, refrigeration, and ventilation, will be conducted in the mornings to permit attendance at the exposition in the afternoons and evenings."

H. G. Gragg of Chicago is chairman of the General Arrangements Committee, assisted by members of the Illinois Chapter, ASHRAE officers, and staff.

Concurrently with the meeting, the 15th International Heating & Air Conditioning Exposition, held under the sponsorship of ASHRAE, will take place at the International Amphitheatre.

"Nearly 500 exhibitors are planning displays."

2, 3 Hp Luxaire Self-Contained Conditioners, Housed In Single Cabinet, Can Be Located Inside or Outside



NEW LUXAIRE air-cooled, self-contained air conditioner shown from condenser end and evaporator end.

* * *

ELYRIA, Ohio—Two horsepower and 3 hp sizes of a new "Luxaire" self-contained, air-cooled summer air conditioning unit have been announced by The C. A. Olsen Mfg. Co. The new unit will be available early in 1961.

The unit is a complete air conditioner, housed in a single cabinet for location inside the building, in the attic, the basement, or a "crawl" space, or outside the building with ducts projecting inside. It is designed for installation with air distribution ducts and can be used in combination with a forced air furnace for year-round air conditioning, or for summer air conditioning only with its own duct system.

Condenser Compartment

The compressor, condenser coil, centrifugal condenser blower, and motor are housed in a separate compartment at one end of the cabinet. Condenser air intake and discharge are made through a common protective grille that is extended through a wall of the building.

"This common intake and discharge feature greatly simplifies installation of the Luxaire self-contained unit, while limiting the distance which the unit must project from the building, when installed indoors," it was stated. "Available as a low cost accessory, a heavy steel frame serves as a supporting collar when the unit is installed outside of the building.

"The evaporator coil, centrifugal evaporator blower, and blower motor are contained in a second compartment at the opposite end of the cabinet, where the conditioned air discharge and intake ducts are connected to flanges provided.

"For weather protection and long life, the cabinet and blower housings are constructed of 18 gauge, zinc-coated steel. The cabinet is heavily insulated with aluminum-faced, glass fibers. The grille is coated with waterproof vinyl.

"The new unit offers unusual compactness. The 2-hp size is 23 in. high, 30 in. wide, and 32½ in. deep. The 3-hp size is 24½ in. high, 35 in. wide, and 42 in. deep.

"Cooling capacity of the 2-hp. size is 23,000 Btuh and will be approximately 35,000 Btuh for the 3-hp size, under standard ARI conditions of 80°F d.b. and 67° w.b. air across the evaporator coil and 95° air across the condenser coil. This is net capacity from which the heat of the blower motor is deducted.

"Provision of separate motors for the condenser and evaporator blowers permits continuous circulation of ventilating air, resulting in more efficient moisture removal.

"The new unit is offered with a choice of controls: (1) for continuous air circulation, permitting the compressor to cycle as the thermostat calls for cooling and permitting air circulation when the compressor is not in operation, and (2) for intermittent air circulation, so that the blower will operate only when the compressor is running."

J. Herman Names Pierce V.P., General Manager

LOS ANGELES—J. Herman, president of the J. Herman Co., prominent air conditioning contractor here, has announced the appointment of Richard J. Pierce as vice president and general manager.

J. Herman Co., established in 1902 in St. Louis, came to Los Angeles in 1921. This firm has done many of the large and important heating, ventilating, and air conditioning jobs in the city, county, and state, it was pointed out.

Since 1933
WHEN YOU NEED...
Air Conditioning & Refrigeration
TESTING INSTRUMENTS and EQUIPMENT
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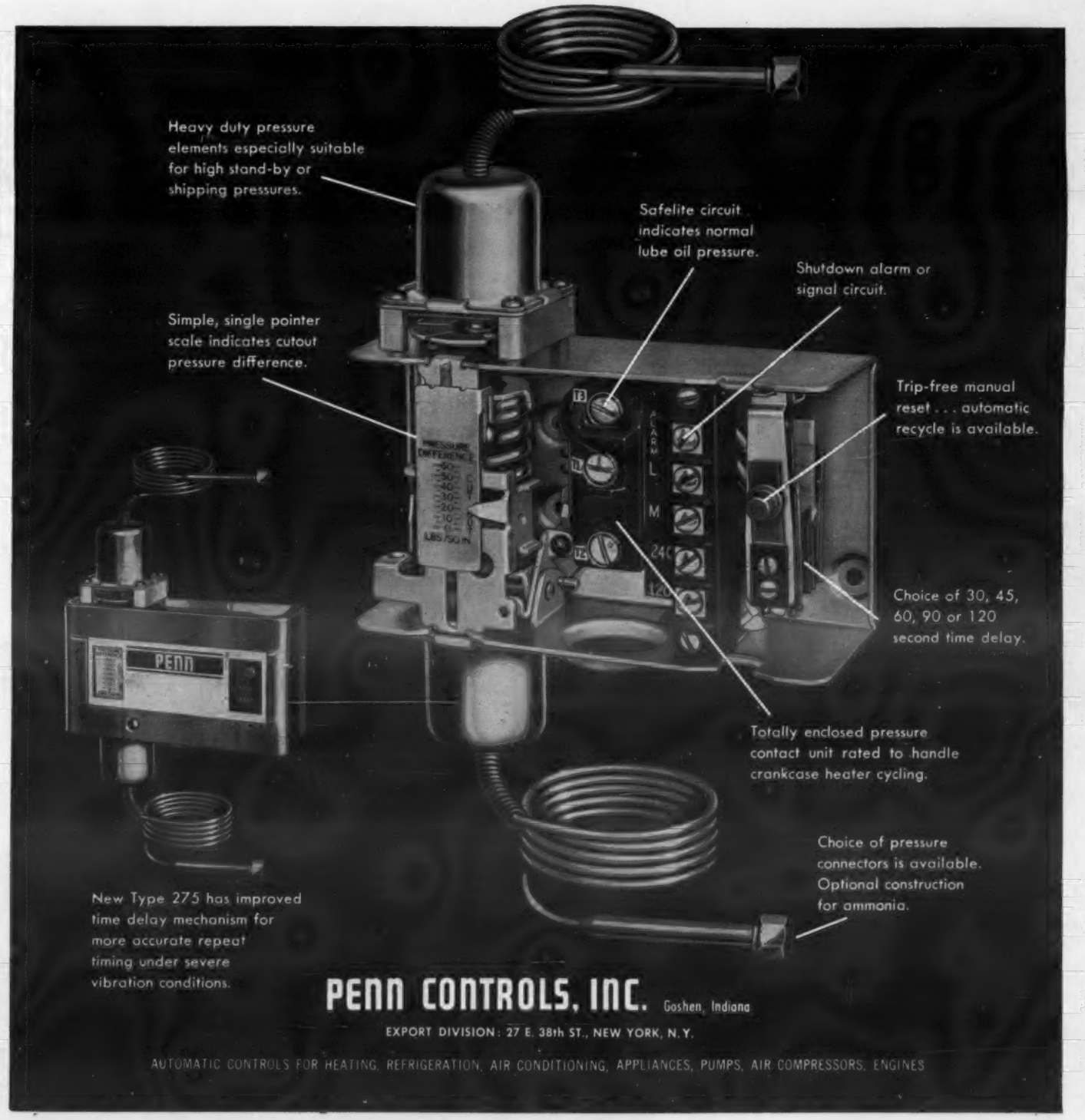
NOW
BETTER THAN EVER!
New Type 275 is the sure way to stop slow pickup or loss of lube oil pressure from crippling pressure-lubricated refrigeration compressors . . . get the complete story from your wholesaler!


Heavy duty pressure elements especially suitable for high stand-by or shipping pressures.
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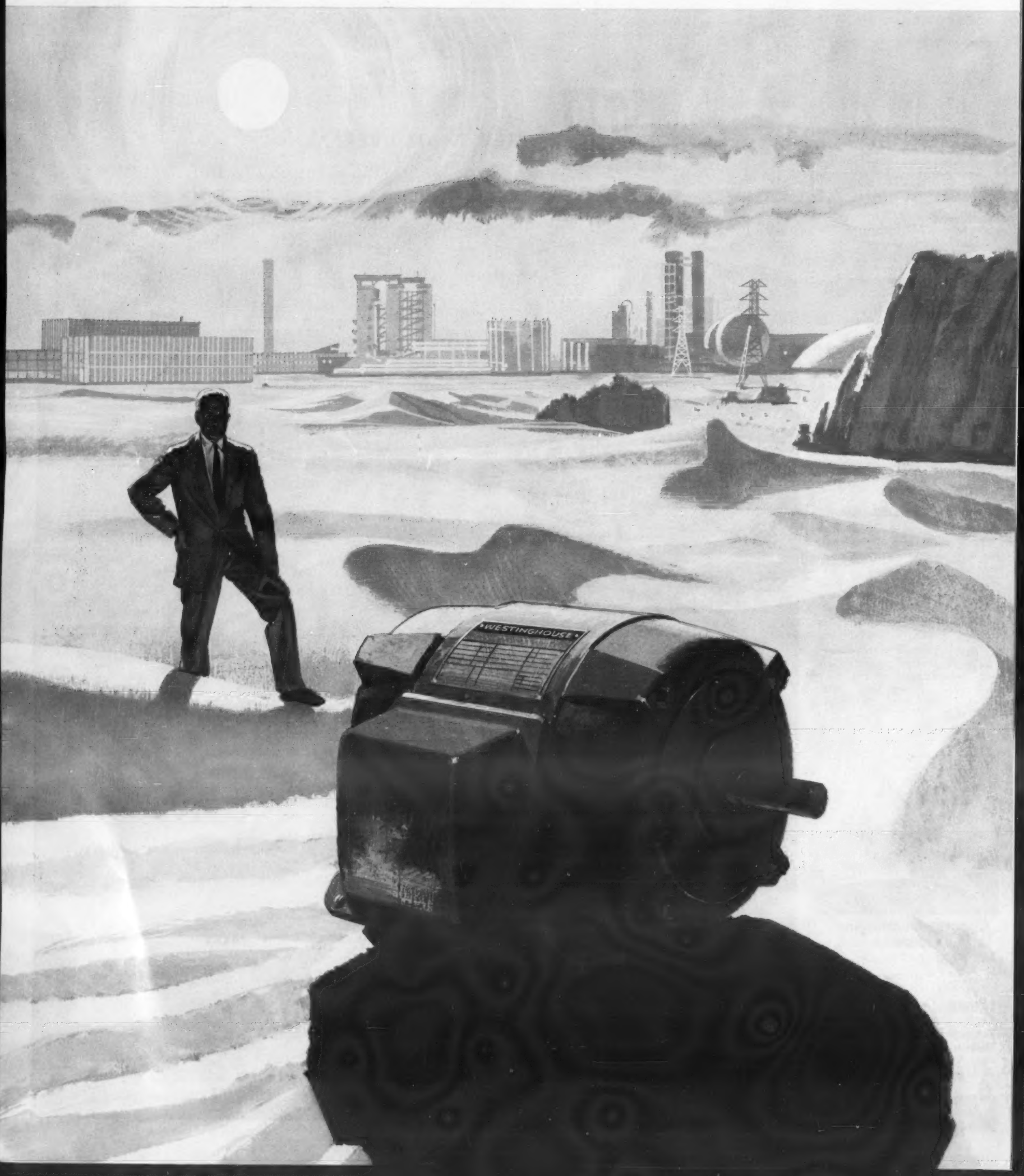
NEW WESTINGHOUSE *Guardistor*



MOTORS LET YOU USE ALL THE HORSEPOWER YOU PAY FOR...SAFELY

The man and the motors from Westinghouse now provide absolute protection against motor failure caused by excessive heat . . .

Our Engineering Manager says:
"With the breakthrough development of the Westinghouse Positive Temperature Coefficient thermistors, for the first time we can provide inherent protection against motor failure caused by excessive heat. The solid-state thermistors buried in the windings instantly sense excessive heat from any cause and simultaneously warn of trouble or automatically take the motor off the line. Thus, motor protection is placed where only true motor protection can be . . . in the windings."

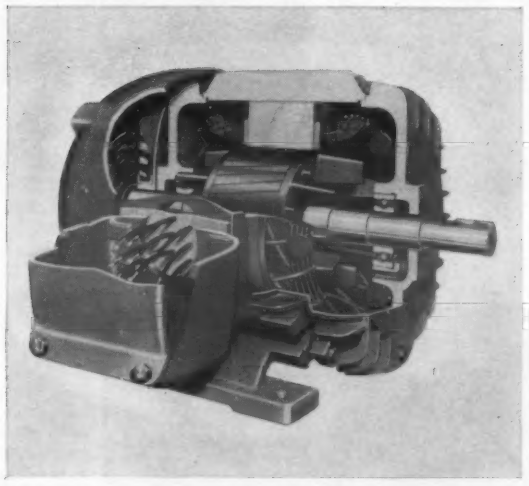
Our Marketing Manager says:

- "You can match the motor to the load . . . use all the motor you are paying for.
- Provides positive protection based on winding temperature . . . *not* load current and/or power supply fluctuations.
- Eliminates time and expense of changing winter-summer heaters. No nuisance tripping, it's fail-safe . . ."

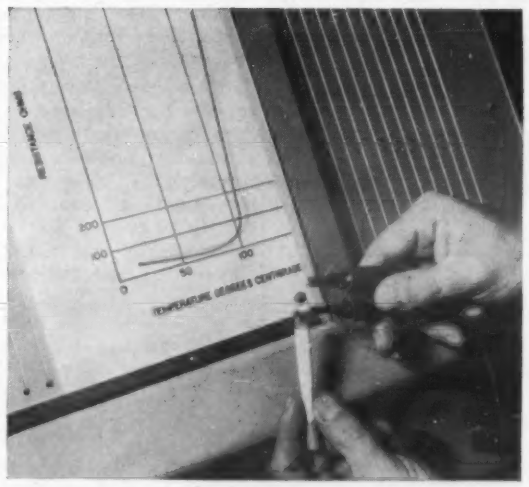
Call your Mr. Westinghouse for the application of a Guardistor* motor to your drive requirements . . . write for *Questions and Answers About . . . Guardistor* (B-7876). Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. You can be sure...if it's Westinghouse.

J-22160-AR

*Trade-Mark



Unlike remotely located sensing devices, PTC thermistors are buried in the windings of the Guardistor motor, instantly equating all temperature factors.



Ever alert PTC thermistors constantly totalize temperature, statically triggering an action *only* if critical temperature is reached.

MOTOR & GEARING DEPARTMENT

Westinghouse

Outside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

(Continued from Page 1)

bean. Population (1,500,000) is chiefly Negro, mixed with European, Chinese, East Indian, and Syrian wayfarers blood.

It exports sugar, rum, bananas, citrus, pimiento, coffee, cocoa, and other agricultural products. And it's a whiledom source of bauxite, the ore from which aluminum is extracted.

Jamaica has a stable, reasonably democratic government—elected every five years by universal adult suffrage. In addition it is a principal unit of the West Indian Federation.

It is blessed with almost constant sunshine, cooled by year-round trade winds, has an abundance of white-sand beaches. No wonder it's happyland for many tourists who like to be comfortable, and don't want to be disturbed by strange conditions.

Business Opportunities

There is no capital gains tax in Jamaica. A Hotels Aid Law grants builders of hostelries exemption from custom duties, excise duties, and tonnage tax on the importation of building materials—as well as income tax relief.

Residential development areas, business sites, and agricultural lands are readily available, at reasonable prices.

The most mature and advanced island of the British West Indies, it possesses all the amenities expected in a sophisticated vacation resort.

Don't go down there looking for a job, however. The local labor market is saturated—except for highly-qualified and specialized professional or technical personnel.

Prospective settlers who might want to start a business there are advised to consult the Government's Industrial Development Corp., 4 Winchester Rd., Kingston 10, before acting impulsively.

Happy and Healthy

Jamaica's year-round sunshine and clean air are conducive to good health. There is no yellow fever or small pox, and so-called tropical ailments are rare. Modern sanitation protects resident and visitor alike.

Private medical and surgical attention is available at reasonable fees in all parts of the island. Dental and optical services are adequate and good.

Standard of education in Jamaica is high, and there is no racial discrimination in its schools.

A motor car is almost a must in Jamaica. Public transportation is scant, scarce, and (to tell the truth!) scary.

Based on requirements for a middle-class family of four, living in Kingston, an income of $3,000 per year should be adequate for house rental, servants, food, schooling, clothing, and maintenance of a Volkswagen.

Rentals for unfurnished homes (two to four rooms, bathroom, dining, and drawing rooms with verandas) range between $75 and $120 per month in the Kingston and St. Andrew areas. Suchlike are much cheaper in rural districts.

Domestic servants—including cooks, butlers, laundresses, gardeners, and nursemaids—hire out for wages ranging from $17 to $25 per week—without food or quarters.

Electricity is available in the towns for lighting, cooking, heating, refrigeration, and air conditioning. Electric current in Kingston is 40 cycles, but a movement is afoot to change that to 50 cycles. Voltage is 110 for domestic use and 220 for commercial and industrial purposes.

In areas not served by electricity, kerosene and propane substitute.

Busy and Prosperous

New capital is being attracted to Jamaica in increasing quantities. Its government has established an Industrial Development Corporation to assist and encourage new manufacturing enterprises.

Excellent opportunities also exist for enterprise capital in tourist-service development, which appears virtually unlimited in its expansion potentialities.

Special tax laws aimed at attracting industry to Jamaica include the Industrial Incentives Law, which provides freedom from income tax up to seven years; the Export Industry Encouragement Law, which duty-frees importation of raw materials and machinery; and the International Business Companies Law, which extends 100% freedom from income tax in *perpetuity* for certain desirable industrial developments.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Candid Corner

AMERICAN EMBASSY in Haiti is designed for the tropics; but it's air conditioned, too. Carrier made the installation.

U. S. NAVY DESTROYERS and DE's can be seen all over the Caribbean. There are marine detachments, handy, too. Some of the boys confide that they'd enjoy pulling a few beards.

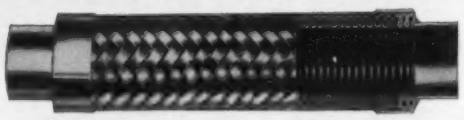
NATIVE vendors clutter up the sidewalks; don't want to let you by unless you buy.

WEST INDIANS don't like to carry things. Instead, they balance them atop the noggin. Makes for good posture and graceful carriage, too.

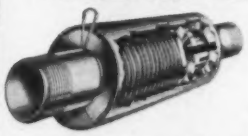
NOT ALL the Haitians live poorly. Here's the patio of a home owned by a member of the native elite. Gracious living, indeed!

COMPLETE CONTROL

of piping expansion, noise and vibration



VIBRA-SORBER . . . precision made with uniform wall thickness, balanced corrugations and special braiding. Recognized by Underwriters' Laboratories. Fatigue and corrosion resistant. Standard of industry for major compressor manufacturers. Tube O.D. from ¼" to 8½". Tested, sealed in polyethylene bag and ready for installation.



MODEL H5 EXPANSION COMPENSATOR... the *first* **ALL STAINLESS STEEL** high pressure compensator. Meets all high temperature and corrosion requirements. Heavy duty bellows; screwed, welded or flanged ends. Takes up to 2" stroke, 175 p.s.i.; temperatures 1000°F. Sizes from ¼" to 3".

FLEXIBLE CONNECTORS... industry's finest to protect pumps, joints and piping . . . absorb vibrations. Made of pressure-tight hose in bronze and stainless steel, up to 24" I.D.—with complete selection of end-fittings.

MODEL "L" EXPANSION COMPENSATOR . . . first choice of industry for baseboard connector systems. Packless design . . . quick, easy installation and completely maintenance free. Maximum operating pressure 60 p.s.i.; takes up to ¾" stroke; in ¾" thru 2" sizes.

RT-6 (REX TUBE) . . . the superior quality interlocked hose for ventilating and air blower ducting and refrigeration tubing armor. In galvanized steel, bronze, aluminum and stainless steel. ⅝" to 8" I.D.

PULL-OUT UNIT — Special Vibra-Sorber for compressors. Assemblies incorporate SAE female swivel on one end, and male flare on other end. Length from 32" to 50"...¼"-¾" diameters.

Write today for complete catalog material

Ad No. IH-420

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SUBSIDIARY OF CALUMET & HECLA, INC.

Church Addition Combines Traditional Architecture, Cooling

ST. PETERSBURG, Fla. — Redeemer Lutheran church's new addition "combines traditional architecture and modern air conditioning in the complete harmony that is often sought but seldom achieved," according to a "Heat Pump of the Month" report by Florida Power Co.

"The remote compressor section of the four Forston heat pumps serve four air-handling units located so that excellent distribution is obtained with minimum ductwork," it was pointed out.

The air-handling units for two 15-ton units are located above anterooms on either side of the sanctuary, and air distribution is made through short ducts and grilles concealed behind the decorative grillework used to enclose the sound chambers of the organ. Air is returned below the chancel through decorative scrollwork.

Two 10-ton air-handling units located on the balcony level serve the rear pews, balcony, and cry room through lined ductwork. Air is returned through structural plenums to the air handlers.

Double sets of oversized filters complete the treatment to provide low sound level.

"As in all of the equipment, particular attention is paid to maintenance of quiet operation from the remote compressor units to the air-handling units isolated from the structure by 'Styrofoam' supports."

General Air's New Quarters Will Double Facilities

NEWARK, N. J. — Mallor-McCabe Co., Newark realtor, reported that the largest industrial building in Stirling, N. J., recently vacated by U. S. Hammered Piston Ring Co., will be occupied by General Air Products Corp. under a long term lease.

The tenant company is moving from Cedar Grove into the 50,000-sq ft building on 4½ acres of land, doubling its present facilities.

General Air will use the Stirling plant for the manufacture of air conditioning registers; slot circular and square diffusers; high pressure air-distribution units for high pressure installations in multi-story office buildings, schools, and institutions; temperature mixing units; and sound attenuation boxes.

Dan Vandament Opens Office In Seattle

SEATTLE — The consulting engineering firm of Dan Vandament & Associates of San Francisco has established a mechanical and electrical consulting engineering office in Seattle.

T. H. Sheldon is office manager here. The Seattle office will do work similar to that done by the San Francisco office.

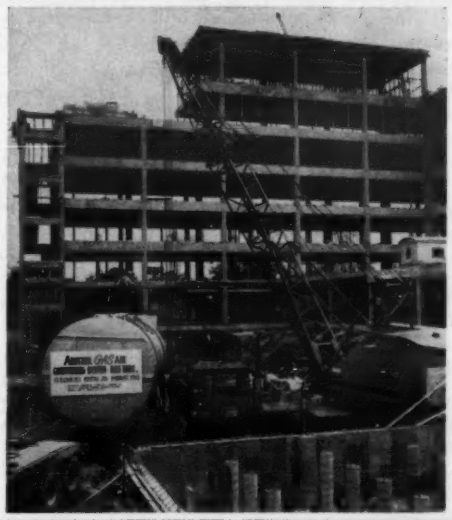
Offices are at 1200 Westlake, N., Seattle 9, ATwater 4-7383.

St. Elizabeth Hospital Gas Air Conditioning Installation Claims Several 'Firsts'

BEAUMONT, Texas — Two boilers for the giant gas air conditioning system of St. Elizabeth hospital completed their rail trip here from Illinois and have been installed, according to United Gas Corp.

Upon arrival, the two 30-ton boilers were transported across the city by truck to the hospital site and then hoisted to an opening left in the roof of a one-story section of the hospital where they were lowered to their resting place in the basement.

Several "firsts" for Beaumont are involved in the project. With an 820-ton cooling capacity, the system is claimed to be not only the largest gas-operated air conditioning installation but the largest of any kind in Beaumont. The hoist is believed to involve the two heaviest single lifts ever handled in commercial construction here.



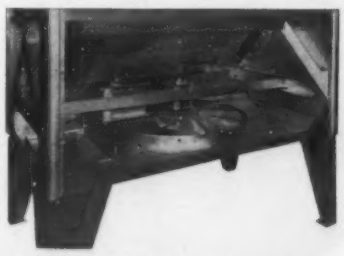
AT THE ST. ELIZABETH hospital building site a crane hoists the boiler preparatory to lowering it in the pit at right foreground.

Steam from the gas boilers will be utilized to operate both the heating and cooling components of the air conditioning system. The steam will be used for a number of other purposes in the hospital, including preparing the large quantities of hot water needed for laundry and cooking.

The firms of Pitts, Mebane & Phelps and D. E. Steinman are associated architects on the project. Bernard Johnson & Associates is mechanical engineer. C. Wallace Plumbing Co. is mechanical contractor, while Robert H. Smith & Co. is general contractor.

The seven-floor, 223-bed hospital is scheduled for completion in the fall of 1961. It will also feature an all-gas kitchen.

compatibility
stands out in
Marley Series B DriCooler®
AIR COOLED CONDENSERS



Ask the Marley Man (or write) for Bulletin DC-60 that explains why DriCoolers also have outstanding . . .

capability
durability
adaptability
controllability

The ability to fit inconspicuously into the planning of new structures or into the surroundings of established buildings is an important characteristic of Series B DriCoolers. In designing these new, high-efficiency condensers, Marley engineers gave architectural compatibility equal precedence with durability and performance capability.

The trim, corrugated aluminum casing conceals fan, motor and coils—completely. The rigid, truss-type structural frame of these low height units is out of view. Diagonally mounted coils minimize over-all dimensions. Inconspicuous, unobtrusive, quiet—these attributes are characteristic of all Series B DriCoolers.

Series B DriCoolers are of vertical, blow-through design that is most adaptable to any desired location. Performance is never affected by wind direction or velocity, and recirculation of heated air is precluded by the air intake and discharge being at different and well-separated elevations.

U. S. and Foreign Patents Pending

THE MARLEY COMPANY MARLEY KANSAS CITY 14, MISSOURI

Consulting Engineers Council Meeting--

(Continued from Page 1)

CEC that such activity by corporations is harmful to the professional status of true consulting engineering firms, which are almost always owned or directed by registered engineers, and that such practices are not to the benefit of the public because the objectivity of engineers employed by other than an independent consulting firm is "naturally under a strain."

'Free Engineering'

Related in a way to corporate practice is the problem of *free engineering*. CEC uses this term to describe offers to provide engineering design direct to the owner with the implication that no engineering costs are incurred.

According to CEC, "The offer of free engineering is adverse to the best interests of the owner since it precludes impartial analysis and comparison on competitive products or equipment." Such impartial services are properly supplied by independent consulting engineers, the council holds.

The directors especially condemned the practice of combining consulting engineering and contracting on publicly financed work.

The council recognizes that there has been much adverse publicity to the effect that governmental agencies are paying unnecessary fees to consulting engineering firms when such service, critics allege, can be obtained at lower prices by using engineering services supplied by vendors or others.

Ethics 'Theoretical Versus Real'

During the 3-day meeting, there was much discussion of ethics, "theoretical versus real."

Several speakers pointed out that most codes of ethics are generalized platitudes to which no one can take exception, but which are useless in practice. One director, who serves on a State Board, emphasized that "State Boards cannot enforce ethics. They can only enforce legal requirements.

"So often," he continued, "professional societies attempt to pass the buck to us when an unethical, but not necessarily illegal, practice is uncovered. When a case becomes too hot to handle, everybody runs for cover. The associations do not take action against their own members."

Related to the matter of ethics was the discussion of errors and omissions insurance carried by most architects and engineers. "Is it ethical to use the possession of insurance as a sales tool?"

Majority opinion felt such a sales tactic is unethical, but some pointed out that legal requirements that they have such insurance makes it almost impossible not to mention the fact sometime during negotiation with the client. Professional liability insurance is available through CEC for its members.

Throughout the directors' meeting, it became obvious that one problem seemed to underly the discussions—the problem of status, of professional recognition.

Members of CEC are strong individualists, free enterprisers who consider their occupation as professional as medicine or law. They tend to bristle, for example, when someone speaks of their being hired for a job; they prefer being *retained*, not hired.

Another example: they are considering action to get exclusive professional listings in the yellow pages of telephone directories.

Strong Public Relations Program Initiated

Recognizing that much of their difficulty lies in the fact that the public and government agencies do not understand the role of the consulting engineer, CEC has activated a strong public relations program. A committee has already produced brochures, has studied other professions' PR. One or two member associations are using radio spot announcements to get the message across; another is making arrangements with a local television station.

M-H Presented With CEC's Merit Award

Minneapolis-Honeywell Regulator Co. was awarded the CEC's first Merit Award offered to companies who do an outstanding job of publicizing the role of the consulting engineer. M-H ran a series of ads illustrating several planks from CEC's code of ethics.

The council has also suggested that its member associations establish contacts with businesspaper and local editors, many of whom "don't even know we exist. Let's tell them."

Standard Test Code for Air Moving Equipment Available from AMCA

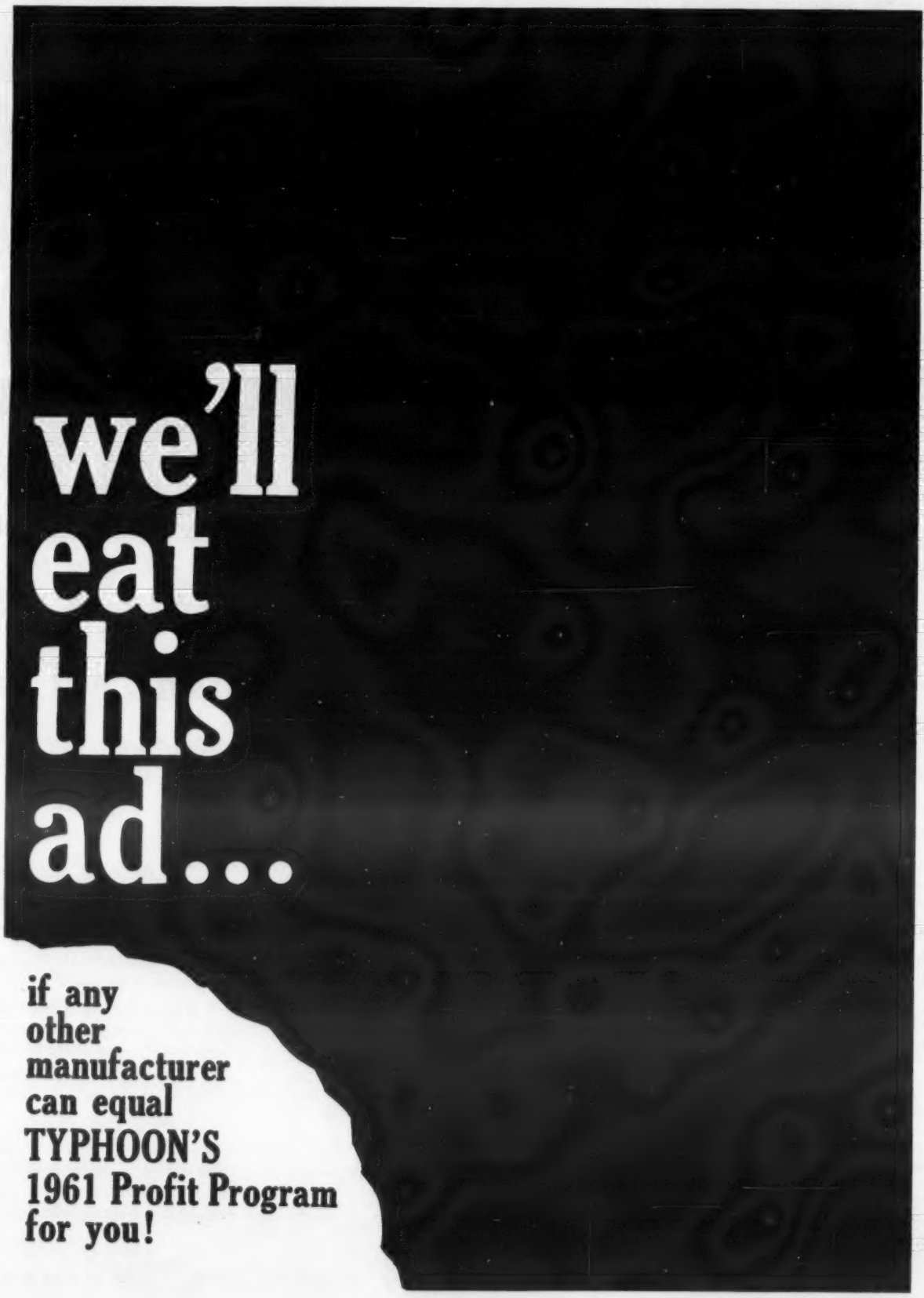
DETROIT — The Air Moving & Conditioning Association's new Standard Test Code covering all air moving devices is now available—as AMCA Bulletin No. 210—to consulting engineers, universities, and commercial and industrial users.

Based on research sponsored by the association and conducted at the University of Detroit engineering laboratories, the code is the result of nine years of intensive effort.

"The new code establishes uniform methods for conducting tests on all types of air moving equipment, and is designed to provide more accurate data upon which equipment performance ratings may be based," the announcement said. "Features incorporated in the 1960 code include nozzle test methods, directions for calculating the effect of compressibility, and other significant engineering advances.

"In order to obtain approval of performance ratings in accordance with the code, test data as well as published ratings are checked by the association and verified by witness tests. Such tests are conducted directly by AMCA engineers, or through authorized independent testing laboratories."

Standard Test Code Bulletin 210 may be obtained from national headquarters of the Air Moving & Conditioning Association, Inc., 2159 Guardian Building, Detroit 26, Mich.



Construction Viewed as Brightest Spot on Economic Horizon for '61

ATLANTIC CITY, N. J.—The brightest spot on the economic horizon in 1961 will be construction, Edwin W. Magee, Jr., economist of F. W. Dodge Corp., said here recently.

Addressing the Building Equipment Div. of the National Electrical Manufacturers Association, Magee said that "the construction industry as a whole is not likely to be adversely affected by the expected mild dip in business activity.

"Some segments of construction, particularly those involving business spending, may go down next year, but public projects, which account for more than a third of the total, should show strength. In addition, easier money should help the housing sector."

According to Magee, total construction contracts in 1961 will amount to some $35.8 billion, a gain of 1% over the estimated 1960 level.

Most of the strength in 1961 is expected in contracts for heavy engineering construction, that is, public works and utilities. Heavy engineering contracts next year are forecast to total $8.9 billion, a gain of 5% over 1960.

Highway construction, which accounts for about half of all heavy engineering construction, is expected to set the pace in this category, backed up by strength in utility construction.

Residential building contracts, by far the largest major construction category, are expected to be up about 1% next year, totalling $15.3 billion.

Total private and public nonfarm housing starts in 1961 are estimated at 1,325,000, a gain of 2% over the 1960 estimated level of 1,300,000 on the current Census Bureau basis of measurement.

Magee said there is some evidence that the backlog of housing demand is not as strong as it has been in the past, and that, while easier money will undoubtedly have some upward effect in 1961, it may not be anywhere near as great as in previous recessionary periods.

Non-residential building contracts are expected to drop 2% in 1961 to $11.6 billion, principally because of a falling off in business spending for new industrial and commercial building offsetting gains in some of the other non-residential types.

Gas Air Conditioning School—

(Continued from Page 1)

use as a sales reference manual.

Program for the course follows:

MONDAY, DEC. 5

8:30 a.m.—Opening remarks. Charles C. Eeles, manager industrial sales, Ohio Fuel Gas Co.

9 a.m.—Air Conditioning Distribution Systems. Alfred L. Jaros, Jr., Jaros, Baum & Bolles.

10:30 a.m.—Reciprocating and Centrifugal Compression Systems. Philip F. Little, Application Engineering Dept., Machinery & Systems Div., Carrier Air Conditioning Co.

1 p.m.—Gas Engine Drive. Norbert K. Hall, manager, refrigeration and air conditioning, Ready-Power Co.

2:30 p.m.—Steam Turbine Drive. John J. Boyle, Worthington Corp.

4 p.m.—Round Table discussion.

TUESDAY, DEC. 6

8:30 a.m.—Gas Turbine Drive. C. R. Apitz, sales engineer, Clark Brothers Co.

10 a.m.—Absorption Systems. Paul E. Chamberlin, air conditioning engineer, The Gas Service Co.

1 p.m.—Boilers. William F. Zunker, sales manager, Industrial Plant Div., Cleaver-Brooks Co.

2:30 p.m.—Cooling Towers, Evaporative Condensers, and Air-Cooled Condensers. Victor C. Nelson, sales manager, cooling towers, Carrier Air Conditioning Co.

4 p.m.—Round Table discussion.

WEDNESDAY, DEC. 7

All day field trip to see absorption systems, gas engine driven compression units driving both reciprocating and centrifugal compressors, 25-ton absorption type water chillers, dehumidification units, and steam turbine driven compression systems.

THURSDAY, DEC. 8

8:30 a.m.—Small Tonnage Commercial Air Conditioning. A. B. Banowsky, utilization sales director, United Gas Corp.

10 a.m.—Humidity Control by Direct Absorption and Adsorption. Robert E. Roberts, manager air-dryer, Bryant Mfg. Co.

1 p.m.—Cooling Load Estimation. W. F. Driscoll, Carrier Air Conditioning Co.

2:30 p.m.—Comparative Cost Analysis. M. E. Orelup, general air conditioning engineer, Oklahoma Natural Gas Co.

4 p.m.—Round Table discussion.

FRIDAY, DEC. 9

8:30 a.m.—Service Recommendations. Frank J. Sylvia, air conditioning and heating specialist, Ohio Fuel Gas Co.

10 a.m.—Electric Competition. John Cousley, industrial applications engineer, Philadelphia Electric Co.

1 p.m.—Market Opportunities. W. J. Ortman, market sales manager, industrial buildings, Minneapolis-Honeywell Regulator Co.

2:30 p.m.—Sales and Promotional Activities. Marvin E. White, district industrial sales manager, Ohio Fuel Gas Co.

Round table discussion panelists for the school are: Russell L. Brown, manager heating and air conditioning products, Arkla Air Conditioning Corp.; W. R. Barnard, Uni-Trane absorption sales, Trane Co.; Keith T. Davis, manager gas air conditioning, Bryant Mfg. Co.; G. Owen Kuhen, sales manager absorption refrigeration, Machinery & Systems Div., Carrier Air Conditioning Co.; and Fred C. Wood, manager air conditioning sales, York Corp.

International Congress Proceedings Will Be Available In 3 Volumes

OXFORD, Eng.—Publication of the proceedings of the 10th International Congress of Refrigeration, held at Copenhagen, Denmark in August, 1959, was announced recently by Pergamon Press, Ltd. here.

Volume 1 covers low temperature physics, heat transfer, and non-food use of cold. Volume 2 covers machinery, refrigerating plants, transport, and education. Volume 3 covers refrigerating foodstuffs, cold stores, and indices.

Until Dec. 31 publication date, the set will be available for $38 and individual volumes at $15 each. After that date price will increase to $22 per volume and $60 for the set.

In the United States, Pergamon Press is located at 122 E. 55th St., New York City 22.

The Industry's Biggest Line of Packaged Units. Typhoon adds 28 new units to its 1961 line of air conditioners, furnaces, heat pumps. Unmatched versatility and scope! A superior Typhoon unit for every need—a solution for every installation problem. As always, Typhoon leads in engineering!

Most Flexible Line. Only Typhoon gives you customized units at little or no extra cost. Mass produced components custom-assembled to your order gives you a tremendous competitive advantage. You can sell without sacrificing profit.

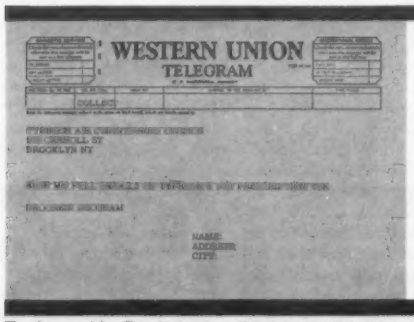
Outstanding Financing Plans. Typhoon again gives you every plan necessary to simplify payment for your customers, while relieving you of financial strain. Helps you stock and sell.

All-Out Sales Effort. Typhoon trains your salesmen. Helps you sell, locally. Does your selling for you, nationally, to headquarters of major chains.

"Prescription for Progress." For 1961, Typhoon dealers are following a master plan for profit—Typhoon's "Prescription For Progress." National advertising. Local promotions. Specialized programs aimed at helping you sell in the Commercial, Industrial, and Residential markets. A wealth of material, carefully planned, skillfully executed ... to give you the ammunition you need to make more, more easily. It's all in Typhoon's "First Aid For Sales" Kit.

Top Travel Awards. An unlimited number of Jamaica vacations available for the winning. All it takes is your salesmanship. We call it "Jamaica Jamination"—you'll call it "taking candy from a baby." That's how easy it is to win!

Study the facts and you'll agree: in every way, Typhoon dealers enjoy a considerable advantage in product engineering, promotions, and profits. For more information, and a brand new Reference Wall Chart on the "Complete Line," use the collect telegram in this ad. Or call or write us.



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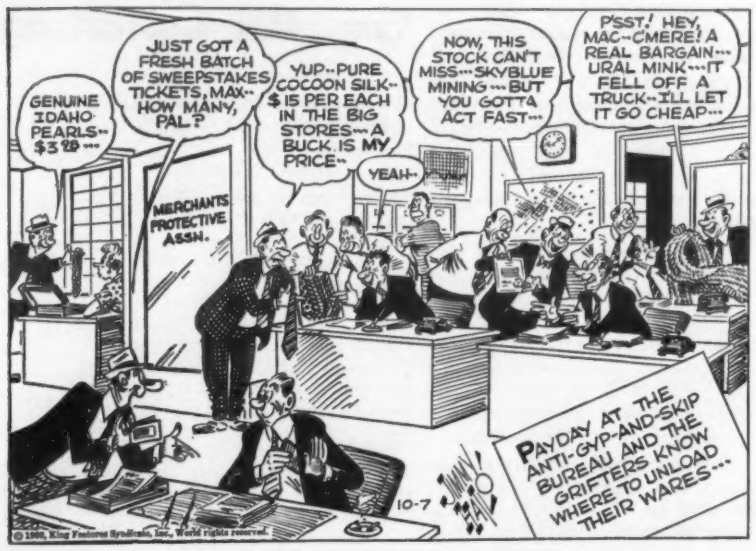
They'll Do It Every Time

by Jimmy Hatlo


GENUINE IDAHO PEARLS--$3.98---
JUST GOT A FRESH BATCH OF SWEEPSTAKES TICKETS, MAX--HOW MANY, PAL?
YUP--PURE COCOON SILK--$15 PER EACH IN THE BIG STORES---A BUCK IS MY PRICE--
YEAH--
MERCHANTS PROTECTIVE ASSN.
NOW, THIS STOCK CAN'T MISS---SKYBLUE MINING---BUT YOU GOTTA ACT FAST---
P'SST! HEY, MAC--C'MERE! A REAL BARGAIN---URAL MINK---IT FELL OFF A TRUCK--I'LL LET IT GO CHEAP---
PAYDAY AT THE ANTI-GYP-AND-SKIP BUREAU AND THE GRIFTERS KNOW WHERE TO UNLOAD THEIR WARES---
10-7
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Refrigeration Service For Supermarkets—Captive Or Independent?

SOME supermarkets perform their own refrigeration service.

Others prefer to farm out this work.

A few of the larger food chains allow autonomous regional divisions to set their own policy.

Of those who use independent service companies, some purchase maintenance contracts which provide for periodic calls; others prefer to have emergency service only.

Several chains have established their own service departments, then discontinued them.

When we consider that over 50% of a chain's maintenance budget can be spent on refrigeration service and another 15% for air conditioning service, the importance to the chain of making the right decision on its service policy becomes obvious.

Several factors are mentioned when chains are asked their reasons for particular decisions—cost, locality, equipment age, modernization policies. But running through all the conversation is a single thought, the most important factor—the availability, or not, of trained servicemen in the area and the willingness, or not, of the chain to keep them trained.

This point of keeping the men trained is the indispensable key to good, economical service, whether service is supplied by an outside company or by a captive group. The need is for regularly scheduled training meetings; for inclusion of the service department in sessions where new and altered equipment is described by manufacturers' representatives; for immediate routing of all design changes to servicemen.

(NEWS reporters have been with servicemen who wasted an hour trying to decide whether a particular case tray was merely a tray or an integral part of the air movement design. A single wiring change on the defrost mechanism puzzled another man for 45 minutes. In neither case had the man seen product data describing the equipment; the data was in the engineering department's files.)

Almost without exception service departments or independent service organizations with a reputation for know-how conduct in-shop training programs, with some degree of formality.

Whether the training is done after hours; whether the men are paid or not; whether classes are held on the premises—these factors are relatively insignificant. It is the attitude, the decision to devote time and personnel to such training activities which differentiates between the successful, efficient operation and its opposite.

Continued learning is mandatory for these people," insists one supermarket executive.

Each chain or division, then, must decide for itself whether it is economical and practical, in its locality, to supply the opportunity for continued learning. If the decision is negative, the chain must turn to one of the several independent contractors bidding for its business.

Other things being equal, the contractor who provides active, continual training for his employes will provide the best service on commercial refrigeration equipment.

A leader knows the truth of the saying: The most important five words are: "I am proud of you"; the next four are "What is your opinion?"; the next three are "If you please"; the next two are "Thank you"; and the smallest word in the world is the pronoun "I." These simple qualities are the things that make for great leadership and if they were universally applied in all of our institutions of learning, business and industrial organizations, political and government agencies, and military departments, the creativity and productivity of the nation could be increased many fold. The application of these truths alone would keep us ahead of the communists.—RUSSELL H. EWING.

If you want to be popular, you must endure being taught many things that you already know.

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F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

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From the Files of the News

25 years ago . . .

National Better Business Bureau recently warned against misuse of the term "air conditioning" in the advertising and selling of products, recommends the recently approved Standards for Rating and Testing Air Conditioners, and offers the following definition: The simultaneous control of (1) temperature, (2) humidity, and (3) motion of the air constitutes the minimum requirements for air conditioning. In a case recently reviewed by the FTC, the advertising of a radiator evaporator as an "air conditioner" constituted unfair advertising, the BBB noted, "and this is the kind of thing we're trying to stop."

"Reliable sources hint that the Federal Housing Administration may purchase one of the well-known electric refrigerator factories for the purpose of manufacturing electrical cabinets for its housing projects," W. J. Rushton told the National Association of Ice Industries, charging the government with trying to ruin the ice industry, through discrimination in favor of electric refrigeration in its TVA and FHA projects. . . . Mary Pickford will star on the ice industry's NBC radio program in '36, in an all-out attempt of that industry to sell its products.

Installation of three air conditioning units doubled the capacity of a Philadelphia cocoa and chocolate firm.

The president of the New York City real estate board predicted that most apartment buildings would be air conditioned within 10 years, although "it would be many years before the average person would be willing to go to sleep at night with closed windows, depending entirely on a mechanical device for ventilation."

When it was guaranteed that "water consumption of this installation will not exceed 40 gpm of 90° water," a New Orleans Westinghouse dealer clinched the contract with the Standard Fruit & Steamship Co. building seeking a year-round air conditioning installation. . . . Virginia Electric & Power Co. in soon to be "colonially-restored" Williamsburg chose heat pump, reverse-refrigeration year-round air conditioning, when faced with the proposition of moving its power plant, and is now able to study first-hand the operation and economies possible in this new system.

10 years ago . . .

With Congressional hearings on Regulation W credit restrictions scheduled to open soon, reports from such groups as the American Finance Conference continue to accuse Regulation W of forcing many lower-income consumers out of the market for durable goods. . . . The largest refrigeration and air conditioning group ever to assemble on the West Coast met at Long Beach for the West Coast Refrigeration and Air Conditioning Educational Exhibit and Conference. Application of the new ASA-B9 safety code for mechanical refrigeration were explained, a slide lecture was presented on basic compressor designs, and methods of removing moisture from refrigerating systems were described during the four-day program of exhibits, discussions, and talks.

"Heat pumps and heat pump installations will rapidly increase in number," A. B. Newton, vice president of Acme Industries, told the Detroit Section, ASRE. Newton said that in many areas heat pumps will help create a desired balance in electric power consumption, and when installed properly, heat pumps are economically sound. . . . A Washington, D. C. dealer has boosted his sales to restaurants by providing a "restaurant planning service" with every salesman on the staff going through a restaurant training course.

Greater assurance of sanitation, and savings in labor are among the principal benefits gained by two leading Los Angeles hospitals which have installed flake-ice machines.

TECH CENTER

by Frank J. Versagi, Technical Editor

On Gas Air Conditioner

Field Men Tell Bryant of Experiences

Theory met practice when the Bryant Mfg. Co. invited utility, distributor, dealer, and company servicemen from throughout the country to a day-and-one-half seminar concerning its absorption gas air conditioner. All contributed freely and frankly on topics of both general and regional interest. In effect, Kansas traded experience with Ohio; New Jersey picked up tips from Texas; and Bryant gathered valuable suggestions from all.

Welding, fan motors, anti-freeze additives, and testing for ammonia leaks were among the subjects discussed. The service representatives from utilities and distributors offered specific comments about the company's installation and service manuals.

"When bringing out an entirely new piece of equipment such as the gas air conditioner, it is impossible to anticipate everything which should be included in manuals and the best way to express pertinent information," stated Samuel F. Shawhan, president. "We are most grateful for the contributions made by the men who attended."

Throughout the entire session it became obvious that the utilities and Bryant dealers are generally happy with the Bryant air conditioner. Their suggestions concerning the product itself pertained to refinements rather than basic improvements. Some typical items proposed: can we have access doors?; can the purge pot be relocated?; a suggestion to move a valve; some suggested changes in the manuals; a call for company specifications on plastic pipe.

The day-and-one-half discussions were frank and covered every phase of installation and service:

* * *

ON SIZING A UNIT — Field experience has indicated that the gas-fired Bryant units can be de-rated for a limited amount of capacity control by underfiring. Agreement was general that the 3-ton unit, normally calling for 120,000 Btu input, can be regulated to as low as 96,000 Btu while still maintaining a straight-line relation between input and output. In actual practice, 90,000 Btu input is set as the limit of de-rating. It was pointed out that any de-rating of the Bryant unit must be accompanied by a reduction in the air supply through the cooling coil in the air distribution system.

There were opposing schools of thought on whether or not it is better, in borderline cases, to oversize or undersize the unit for an application. Those holding for an undersizing cited the usual need for humidity control and the elimination of short cycling. Opposed were those who insist that people don't care much for humidity; they want temperature control.

This group cited recent engineering studies which apparently show that the old comfort chart is inaccurate, that humidity has much less influence on comfort than formerly thought.

* * *

ON LEAK TESTING — The use of a sulfur candle to detect ammonia leaks was alternately described as effective and useless by the attendees. Most favored the use of phenolphthalein-treated paper or of sprayed phenolphthalein for leak detection.

Describing his use of sulfur for testing, one utility representative said he sets the sulfur candle in the bottom of the unit. If there is an ammonia leak, a stringer of white fumes will rise from the general area of the leak. At this point, he removes the sulfur candle, lights a sulfur taper, and pinpoints the refrigerant leak with the taper.

Those who recommended brushing or spraying the chemical indicator on the suspected area stated that phenolphthalein turns very red on the immediate area of the leak.

* * *

ON WELDING — Apparently, most gas utilities have expert welders whose forte is pipe line erection and repair. "Turn them loose on thin wall tubing and they blast a hole right through it," was a frequent lament. Since Bryant can do nothing to control this situation, the consensus was that in the field, welders must be trained to use smaller torches and to exercise more care in the repair of coil leaks.

Several utilities described their techniques for gaining access to the condenser and absorber coils which might need repair.

An interesting discussion centered around welding performed on the lower half of the machine, the portion which normally contains solution. Many of the servicemen were surprised to learn that the unit can be tipped to any position without harm to its internal components. To weld below the solution level, the unit can be tilted to any side to drain the solution away from the area which needs repair.

J. A. Mekel, Bryant's service manager, who chaired the fact-finding session, pointed out that some joints on the machine are powder-brazed and that the same material is available in rod form for field repair of any leaks. He emphasized, "It is mandatory that whatever rod is used be applied in the flame's reducing atmosphere to avoid scaling. Nearby welds must also be protected."

* * *

ON THE USE OF ANTI-FREEZE — Considerable time was spent discussing the advisability of using anti-freeze to protect cooling coils when installed in an area unheated during the winter. This is especially significant since the company supplies an additive which it recommends for the chiller circuit, and when the additive and anti-freeze are in the same solution, the former may be neutralized.

A few claimed that using permanent anti-freeze resulted not merely in passivation of the additive but in the formation of harmful acids. Bryant recommends the additive be put in all existing systems as well as new installations to avoid formation of precipitates which could plug the screens on the freeze-proof water pump.

Differentiation was made between permanent type anti-freeze and the methyl alcohol type. Apparently, the latter can be mixed with Bryant's chiller inhibitor without harm, but professional sources seemed less than unanimous on this differentiation.

For the most part, Bryant personnel advised against the use of anti-freeze.

"Even when the coil is exposed to winter conditions, there is almost no time when it will reach freezing temperatures if it is properly insulated," suggested Richard Merrick, chief engineer of gas air conditioning. "In addition, the natural flow of air between it and the occupied area will help keep its temperature up."

Several disagreed and added that there are instances, as in summer homes left unattended in winter, where the units will definitely reach freezing temperatures. There were experiences, too, to indicate that the theoretical loss of thermal efficiency caused by the addition of anti-freeze is more academic then practical.

* * *

ON INSTALLATION PRACTICES—Utility servicemen commented that excess leakage of air around the base of the unit may cause a pilot outage.

"Make this very clear; put it in boldface on every piece of literature and on the unit," they suggested.

The possibility of pilot outage is a condition which Bryant is correcting in current production by extending the combustion chamber floor to the front of the unit.

Another finding: when multiple units are mounted close to each other, particularly near to a wall, the center one (or ones) may be starved for fresh condenser air, and will draw in hot air from adjacent units. This creates undesirably high ambient conditions for the unit. One solution—install units with condensers facing the prevailing winds.

On flat-roof installations, apparently, the units may be as close as 18 in. apart without creating this difficulty. Although measurements have shown air temperatures near the center of a flat roof to be 6° or 7° higher than at the roof's edge, the height of the Bryant unit takes it well out of these higher ambients.

It is necessary to avoid placing the unit in a "pocket" which might restrict the entry or discharge of condenser air. The group felt that the manuals should be more specific on this subject.

* * *

MISCELLANEOUS ITEMS —Adding as much as one gallon of water to the chiller may be the answer to freeze-ups during low-ambient operation.

- Apparently, gas utility engineers have a great deal of interest in air flow. The field measurement of air through plenum coils is difficult; some utility servicemen expressed a need for pressure-drop data for dry coil as well as wet coil.
- For about $65 it is possible to install ducts with the heating system which will handle cooling when added; "There is really no difference except material in installing 10 by 22's instead of 8 by 18's."
- Operating costs about the country for the gas air conditioner vary from $10 to $15 per ton per month, averaged over the cooling season, depending on climate and utility rate.
- Originally a few units created a start-up noise lasting only a few seconds. This was corrected in the field. By far the majority of customers have found the start-up and operating noise level most acceptable.
- It is advisable for utilities to establish installation specifications which must be followed by contractors—Inspect installation before turning on gas.

NEWS interviews with participants repeatedly evoked the remark, "I got more out of this meeting than Bryant." During the plant tour, visitors also commented favorably on the scope of quality control inspections and tests.

Bryant's evaluation of the results was equally enthusiastic. Based on the success of this session, plans are under way to hold similar Service Seminars in the field.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

MIGHTY MITE MOTOR PROTECTORS

ADD DEPENDABILITY AND SAFETY TO APPLIANCES WITH MIGHTY MITE

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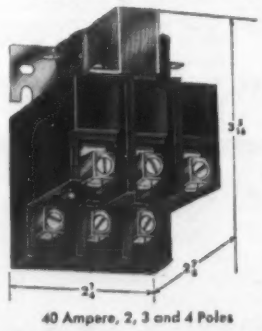
TYPE "B" CONTACTORS

for ALL your Air Conditioning Installations!



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- **25 AMP CONTACTORS** — 2 and 3 poles.
- **30 and 40 AMP CONTACTORS (illustrated)** — 2, 3 and 4 poles, for installations up to 10 horsepower.
- **"PLUS" FEATURES INCLUDE** — small size, double break contacts, moisture resistant molded coils, easy-to-wire pressure terminals, fail-safe operation, "no-kiss" magnets, long-life construction, and Irridite finish.

Available as open-type units or with Universal General Purpose Enclosures. Write for new 4-page circular, No. A-260. The Arrow-Hart & Hegeman Electric Co., Dept. ACHRN, 103 Hawthorn St., Hartford 6, Conn.

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What's Going On in Commercial Refrigeration

News of Markets, Products, Methods

NILFP Plans New Publicity Program

ELIZABETHTOWN, Pa. — The National Institute of Locker & Freezer Provisioners will hold a public relations kick-off meeting in Chicago's Hotel Morrison on Dec. 6.

Purpose of the meeting will be to announce the over-all plans and to finalize the organizational framework of a long-range national public relations program for the locker and freezer provisioning industry, the institute said.

'Grocerette' Vends 10 Products

DENVER—A new line of refrigerated and non-refrigerated grocery vending machines is now being manufactured and distributed by three Denver meat packing executives organized to do business as Grocerette Vending Machines, Inc.

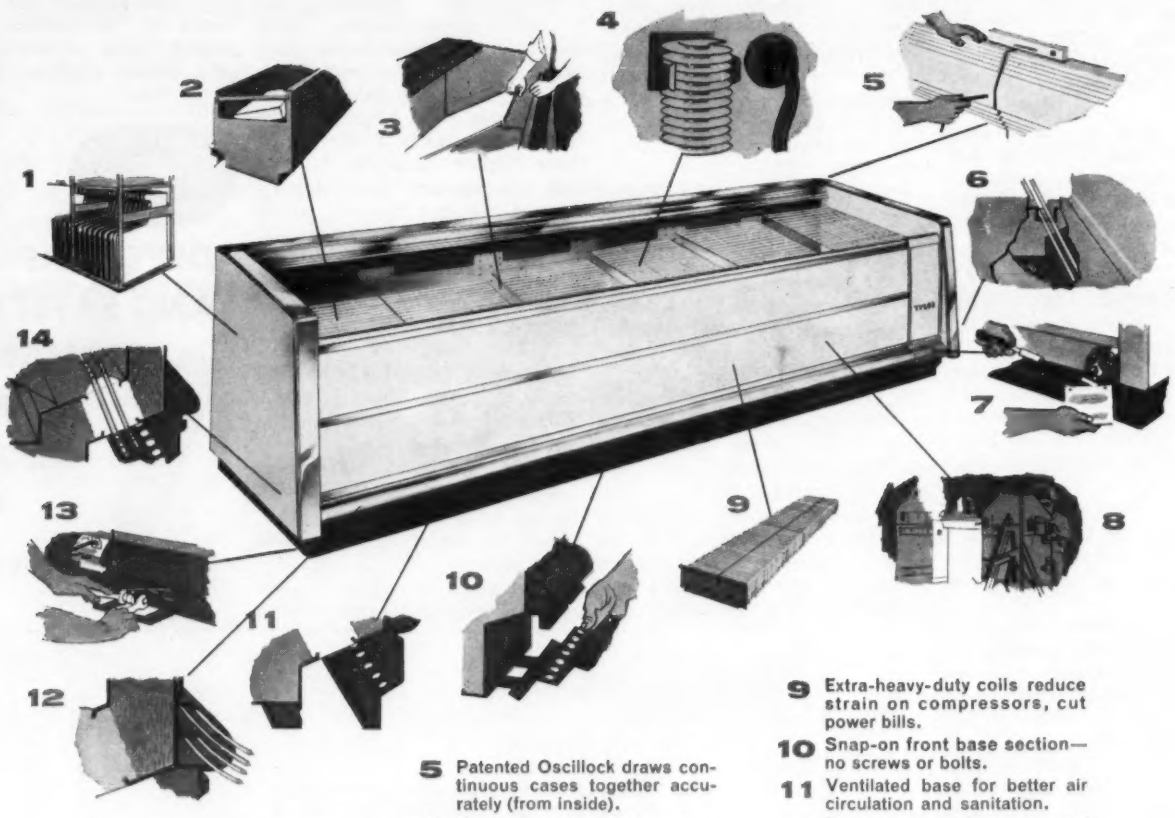
Designed for outdoor use after hours, the "Grocerettes" dispense 10 products each and operate automatically. A change-maker is part of the machine.

Each machine measures 76 in. high, 53 in. wide, and 33 in. deep and weighs 900 lbs. Compartments are adjustable to handle various size products such as meat, eggs, milk, beverages, canned goods, and bread. Machines operate on 110-volt a.c.

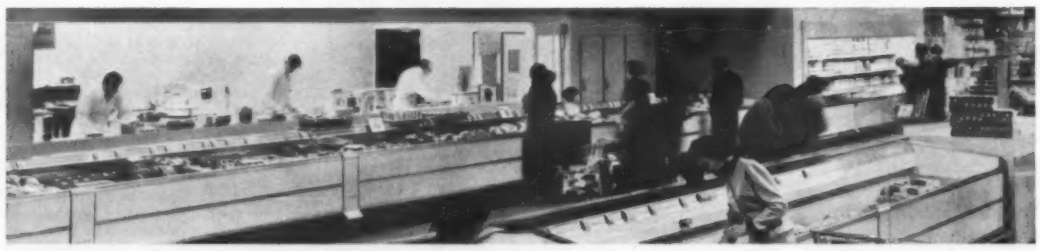
Seymour Heller, executive vice president of the company, reports that 16 of the machines are out on test locations in Denver and 16 more are being tested in Long Beach, Calif.

Set up in pairs—one non-refrigerated and one refrigerated—they are placed in supermarkets, motels, apartment houses, trailer courts, college dormitories, bowling alleys, and 24-hour service stations.

TYLER Hidden Features save you time and money



1 Ends installed at factory — not in the store!
2 Parts and accessories shipped inside proper Sales-Case.
3 Lift-out bottom pans for easy access to all components.
4 Snap-on defroster, plug-in electrical outlets.
5 Patented Oscillock draws continuous cases together accurately (from inside).
6 Continuous-case lines can be assembled outside cases, then lowered in one piece.
7 All wiring connections concentrated in one place at end of bumper guard.
8 Welded-steel shell provides uniformity and strength, true line-up.
9 Extra-heavy-duty coils reduce strain on compressors, cut power bills.
10 Snap-on front base section—no screws or bolts.
11 Ventilated base for better air circulation and sanitation.
12 Heavy-duty cart bumper guard serves as electrical raceway for all wiring.
13 Tyler Tru-Line Locking Device insures perfect line-up of continuous installations.
14 Polyurethane seal, factory-foamed-in-place, pre-seals refrigerant line access.



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ADDRESS_____

TYLER REFRIGERATION CORPORATION, Niles, Michigan

Canada: Tyler Equipment Sales Ltd., 732 Spadina Ave., Toronto, Ontario. (Export: Tyler Refrigeration International, C. A., Apartado Postal 9262, Caracas, Venezuela, South America)

NCRSA Survey Finds 9 Mos. Sales Up

PHILADELPHIA—Total dollar sales for the first nine months of 1960 by commercial refrigeration equipment distributors reporting figures to the National Commercial Refrigerator Sales Association increased, on the average, 17% over the same period last year, Marie Lawton, executive secretary, reports.

Dollar net profit for the period was 9.94% ahead of last year.

Total dollar sales for the third quarter were up 8.41%.

As of Sept. 30, inventory was 5.02% greater than last year while accounts receivable dropped .07%.

Exhibits Praised At Dairy Show

CHICAGO — When the 22nd Dairy Industries Exposition drew to its close after a week's stand in Chicago's International Amphitheatre on Nov. 5, more than 19,000 persons from the dairy industries had witnessed what was generally conceded to be one of the best dairy shows in history, according to the Dairy Industries Supply Association.

In a statement at the close of the exposition, Fred M. King, Wyandotte Chemicals Corp., chairman of the Exposition Committee of DISA said:

"From dairy processors and other visitors to the Show, we have had praise for the usefulness of the displays. From exhibitors, we have heard that sales and inquiries were at all-time highs."

Visitors to the exposition came from 20 countries beyond the United States and Canada. According to Joseph S. Cunningham, executive vice president of DISA, the number of guests from overseas set an all time record.

The next biennial exposition will occur in the autumn of 1962 in Atlantic City, N. J., on dates yet to be announced.

Osborn Represents Bally In Florida

BALLY, Pa. — The appointment of James K. Osborn, Miami, Fla., as regional sales representative for Bally Case & Cooler, Inc., has been announced by Leon Prince, general sales manager.

Osborn will promote the sale of the complete line of ice cream and dairy display cases throughout Florida. He has been active in the sales department of the Sealright Co. of Fulton, N. Y. During the past nine years his headquarters have been in Miami and he has served the south and central sections of Florida.

IGA Wholesaler Offers 'Packaged' Food Market

ST. LOUIS—A "package store" building program has been launched by Wetterau Grocery Co., Independent Grocers Alliance wholesaler.

The stores are uniform markets—built of concrete block covered with brick—which can be in operation 90 days from the time they are approved, according to the company. Two of the 6,440-sq ft "Foodliners" were to open around Thanksgiving in this area. The company plans a dozen or more of the package grocery stores in 1961.

Wetterau Grocery also has plans for a package store of 8,880 sq ft for larger towns and is giving some thought to an even larger one of some 10,000 sq ft.

Construction of the package store is standardized, but each owner can give his market a distinctive atmosphere by selecting his own murals and colors.

Non-selling area is held to a minimum, and grocery, produce, and meat backroom areas each has a separate delivery entrance to increase efficiency and reduce wasted aisle space. The "sixty-four-forties," as the smaller stores are called, are of nearly square construction so they can be expanded 30 to 40 ft without getting out of proportion.

Refrigeration Blamed, But Didn't Set Fire In Supermarket

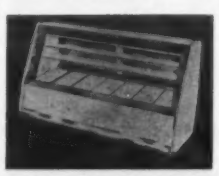
DETROIT—"Faulty refrigeration equipment" was erroneously blamed with starting a $100,000 supermarket fire here recently.

NEWS investigation reveals that, while the actual cause of the blaze is still undetermined, the files of Detroit's Fire Commission state that study so far has "failed to disclose that the refrigeration system was at fault."

Detroit's Bureau of Safety Engineering, which oversees and controls refrigeration and air conditioning installations, determined independently that refrigeration equipment did not start the fire as first newspaper accounts related.

ACH&RN found that the erroneous information was included in early stories because the supermarket personnel recalled that their refrigeration equipment had been serviced several times in the weeks preceding the fire. Their first reaction was to blame the equipment for the fire.

DISPLAY CASES



Howard manufactures a complete line of commercial refrigerators and freezers. Priced right, provides more daily sales and profits.

Territories for distributors and manufacturers' agents.

For a free Master Catalog write to Dept. N.

Howard Refrigerator Co., Inc.
4745 Worth St., Philadelphia 24, Pennsylvania

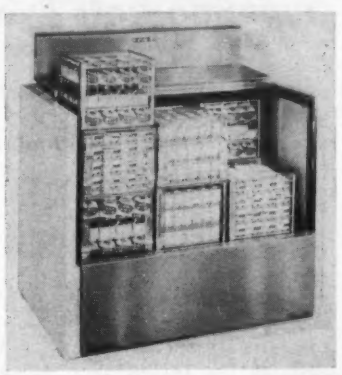
Cooler For Restaurants Serves Carton Milk Directly from Crate

HATBORO, Pa. — A new series of milk coolers for the storage and serving of milk directly from the milk case has been announced by the Powers Equipment Co., Inc., 458 Oakdale Ave. here.

"By using this system, volume consumers of milk in paper, plastic, or glass container do not re-handle the containers in the cafeteria or restaurant, the company pointed out.

"The milk supplier delivers the milk in his own crates. The crates are stored until required in these specially-designed refrigerated cabinets.

"Even more convenience can be realized by placing this refrigerated cooler on the cafeteria line and allowing the customer to serve himself directly



from the milk case without transferring bottles or packages."

Literature describing this equipment is available from the manufacturer.

Warren Shows Managers New Plant Addition, Five New Product Models

ATLANTA—The Warren Co., Inc. recently held a three-day meeting of its regional managers and national-accounts managers.

One of the highlights was a tour of the company's new 45,000-sq ft addition, already in use, and the in-process installation of a 4,000,000 Btuh gas-fired enameling plant to complement its modern conveyor-fed porcelain oven.

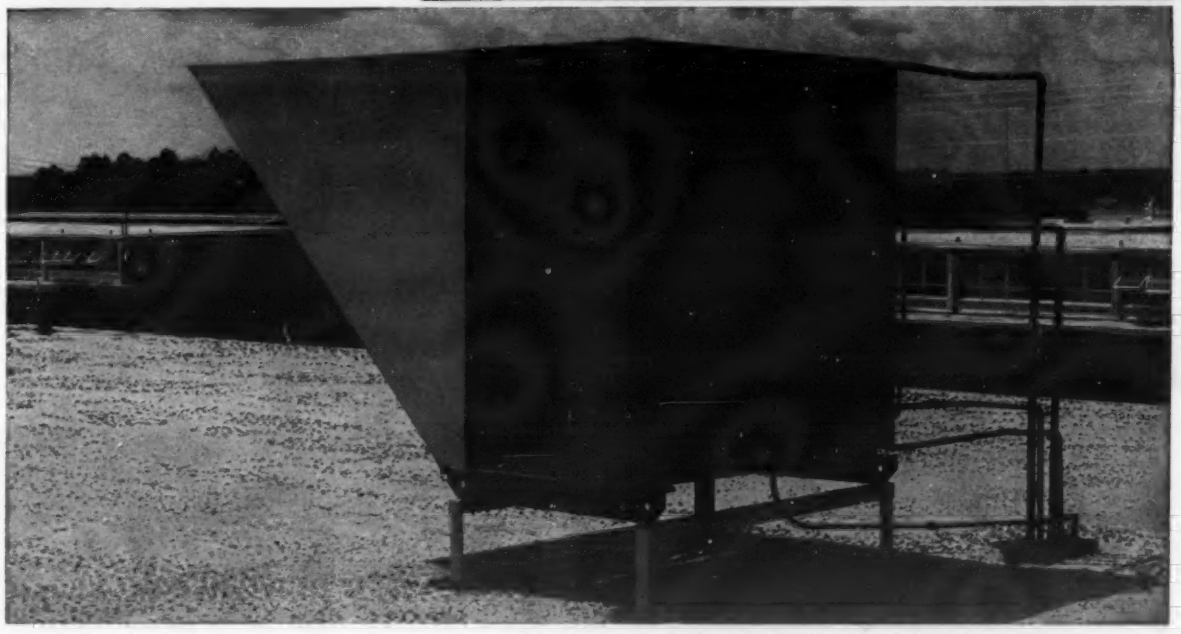
The new addition houses extended production lines and triple-deck bins for accumulating finished refrigerators for loading onto the company's fleet of trucks, which deliver Warren products throughout the entire country, it was noted.

The attending managers were indoctrinated on a number of new Warren models, which include: (1) two new meat versions of the company's patented "Twin-Isle"; (2) a Twin-Isle with or without refrigerated canopy for two-side merchandising of produce; (3) a new high-wide produce case, available with a variety of superstructures; (4) two multi-deck merchandisers, one for meats and one for produce—with or without storage; and (5) a self-contained ice-cream/frozen-food cabinet.

Roger Jacobs, executive vice president and sales manager, told the managers of the company's "significant sales increase" for the fiscal year ending Sept. 30 but challenged them to exceed their 1960-61 goals by 20%.

WORLD'S LARGEST FARMERS MARKET USES

LARKIN ZEPHYRCONS



BFC-16 on guard—one of more than 50 Larkin Zephyrcon Air-cooled Condensers at the Georgia State Farmers Market. A full range of both FCs and BFCs are used, many with multiple circuits.

Value-Packed Features

- Direct-drive FC models—for economy and easy maintenance.
- Belt driven BFC models—for larger installations, lowest noise level.
- Patented Larkin cross-fin coil—aluminum fins and staggered copper tubes.
- For use indoors or outdoors.
- A single large fan on BFC model assures low operating noise level.
- Motor on BFC model is standard NEMA design mounted on adjustable base.
- Slow speed motor on FC model is permanently lubricated, has overload protection, and is mounted on resilient base.
- Casing is of heavy-gauge steel.
- Unit finished with baked-on epon-base primer and melamine top coat for maximum protection.
- Motor is enclosed in casing, protected from the weather.
- Discharge shield available.
- Fan guard is standard equipment.
- Return bends protected by heavy-gauge shield.

At the world's largest farmers market the products are protected from the ravages of hot weather with the help of Larkin Zephyrcon Air-Cooled Condensers. More than 50 Zephyrcons provide ample condensing capacity for the big market's refrigeration systems which employ over 200 Larkin high and low temperature humi-temps.

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Foodland Supermarkets In Seattle Build Traffic, Make Profit with Cafeterias

CHICAGO — Now it's cafeterias and restaurants in super markets!

How successful they can be was told in a recent *NARGUS Bulletin*, official magazine of National Association of Retail Grocers of the United States, whose members operate 112,000 stores throughout the nation.

An article in the September issue by Mrs. Claire Gorman, supervisor of four cafeterias and restaurants in Frank Wald's Foodland Supermarkets, Seattle, Wash., described the new sales volume and additional traffic brought into the supermarket by the restaurants.

Furthermore, Mrs. Gorman said, ". . . operational experience has shown something else that was originally considered too good to be possible—a restaurant in a supermarket will not only bring new people into the market, but it will—if operated properly—build additional profits besides."

She said Foodland Supermarkets have proved this to their complete satisfaction in all four Foodland markets in operation last year. Sales are over $75,000 annually in each unit. A fifth store will have the largest restaurant of them all.

While all Foodland markets are large, from 50 to 80 employes each, Mrs. Gorman believes a restaurant could succeed in a medium-size one.

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Owners Report - -

Supermarkets Evaluate Refrigeration, Air Conditioning

ONE OF A SERIES presenting the experience and evaluation of users of air conditioning and refrigeration equipment.

By Phil B. Redeker

LOS ANGELES—Better training for the men who install, service, and maintain air conditioning and refrigeration equipment.

Longer life for installed equipment before replacement becomes necessary—at least as long as the period over which it is depreciated, and preferably a few years beyond that.

Certain improvements in defrosting systems for low temperature refrigerated display fixtures, to assure against any temperature rise in the fixture that might lead to defrosting and then re-freezing of frozen food products.

Air conditioning systems designed specifically for the special problems encountered in food supermarkets.

The above-named are the principal things which E. E. Collins, mechanical engineer for the Safeway Stores chain of food supermarkets, hopes that the air conditioning and refrigeration fields will give heed to in the near future. Collins has the prime over-all responsibility for the selection of the design and type of mechanical equipment that goes into Safeway Stores, and the areas for possible improvement which he describes comes out of experience with air conditioning and refrigeration equipment extending over several years.

"Trained people are the big key to many of the industry's problems, as I see it," Collins said. "Manufacturers have been expanding and improving training programs, and anything further along these lines will help.

"At the mechanics' level, the type of joint training program which Refrigeration & Air Conditioning Contractors Association of Southern California is carrying out with the union, to improve the skills of both the apprentice and journeyman, is an outstanding job."

Getting Longer Life From Equipment

In the matter of getting longer life for air conditioning and refrigeration equipment, Collins sees improved practices in installing, servicing, and maintaining the installations as possibly even a greater factor than possible improvement in the design and manufacture of equipment.

"To Safeway stores, obtaining the 'full-life' of equipment—in terms of at least the complete period over which its cost is to be amortized—is particularly important," Collins points out. "Even though Safeway may design and have built a structure in which it will operate a market, the actual physical property is sold to a private investor and leased back to the food chain. Thus there is always a known fixed charge for the facilities which any store occupies.

"In like manner it is desirable to have a known fixed charge for the equipment used in the building. So, when air conditioning or refrigeration equipment has to be replaced before it has attained its expected life, the unforeseen extra expense adversely affects the profit for that particular store.

"Keeping this in mind, I think it must be obvious that major buyers and users of equipment are going to look to manufacturers to improve the quality and the life expectancy of their products. On the other hand, many breakdowns are not the fault of the equipment so the users must also look to the contractors to carry out the installation and maintenance work in accordance with the highest possible standards."

Some of the things on which major buyers and users of equipment would like assurances from manufacturers and dealer-contractors are the use of modern methods in the checking, testing, evacuating, and other processes in the installation, start-up, and maintenance of equipment in which the refrigeration cycle is involved. There have been many advances and improvements in tools and instruments as well as in methods, Collins points out, and big users of equipment would like to feel that the firms with whom they are dealing are forward-looking enough to make use of the methods and tools in their day-to-day operations.

Trend Toward Multiplexing

Discussing trends in equipment and in installation practices, Collins said that in some of the more recent work there had been more "multiplexing" of compressors in recent commercial refrigeration work than he had noted in some time.

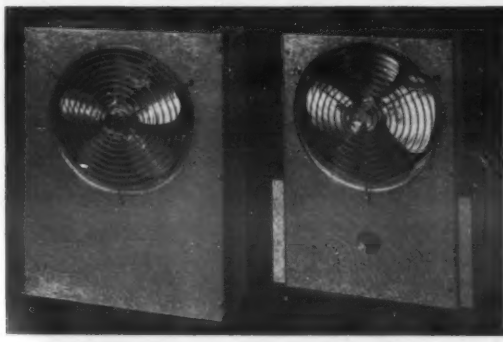
Not so long ago, the industry seemed almost to be standardizing on the use of individual compressors for each fixture in store installations. However, Collins cites an installation of which he has knowledge in which 72 ft of low temperature display cases are refrigerated by a single compressor.

"The decision will depend on the circumstances of the individual job," Collins relates. "With labor costs continuing to increase, the use of larger compressors and multiplexing of several fixtures to a single compressor seems to be attractive in terms of reducing first costs.

"But there is also the question of dependability, and the possible loss of thousands of dollars of foodstuffs if a compressor handling several fixtures should break down. Generally speaking, I couldn't favor multiplexing unless, first, the several fixtures to be served by one compressor all had the same operating temperatures and had generally the same kind of low sides and secondly, there were adequate storage facilities at the store or very close by which could store foods at any desired temperatures in the event of an emergency."

Multiplexing Justified By High Power Rate

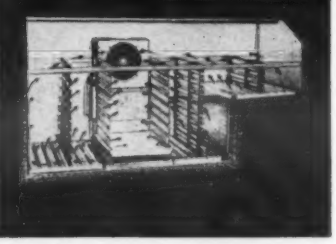
Sometimes there are special situations which dictate the kind of refrigeration units which may be installed. Collins described one such in an eastern state, wherein a special electric power rate was offered on equipment that had a large initial power demand, such as large electric motors. In this installation, large compressors were used and considerable multiplexing was done, but the savings on power cost were so great that it was possible to provide a complete


NEW Krack Dry Box Bottle Coolers

New Design

Chilled air, discharged from *bottom* of KRACK BOTTLE COOLER flows under floor racks and is thrust upward for uniform distribution. High velocity air flow maintains constant temperature despite frequent opening of doors.

Eight UL Models



Upsweep air flow blows out "hot" spots
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Improved Materials . . . Attractive, rust-resistant, embossed aluminum housings. Components of greater durability insure better performance, longer service life.

Easier Installation and Servicing . . . Interiors are easily accessible. Backwall motor mount simplifies handling of cover panel.

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Manufacturers of Freon, Recirculated, Flooded or Direct Expansion Ammonia Heat Transfer Equipment

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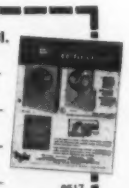

9517

standby compressor system, to handle emergencies that might be caused by breakdowns.

Certain advances and trends in equipment may also bring about some changes to be considered in the selection of components. The "air curtain" type of refrigerated display case design has called for some added refrigeration capacity, for example.

Sees Little Change In Equipment Coming In Near Future

Generally, however, Collins does not see any great changes coming in the near future in the type and form of food supermarket refrigerated equipment. In Safeway's new store plans, for example, there has been a trend towards a standardization of arrangement of refrigerated display equipment.

Where the store is rectangular in shape, the general arrangement is to put the frozen food and ice cream cases on the aisles perpendicular to the checkout stations, the meat section usually at one side of the store, and the produce cases at the opposite side. The dairy department refrigerated fixtures are placed along the rear wall.

Designing Air Conditioning For Supermarkets

In the design of air conditioning systems for food supermarkets, Collins makes these points:

1. It would seem generally unwise to attempt to adopt a standard design or use the same type of equipment in all stores. Roof-top installations making use of air-cooled units may be fine for one type of a store in a particular geographical location, but might not be at all suitable for other stores in other locations.
2. Particular care must be taken in the selection of the type and location of air diffusers, to make certain that there will be no drafts sweeping over the open display cases.
3. Don't "over design" an air conditioning installation for a food supermarket.
4. Make the operation of the system as simple as possible, and the operating instructions clear and understandable.

Condenser Selection Based on Water, Ambient Conditions

What kind of condensers are selected for the systems used in Safeway stores? There is no established policy or set pattern, says Collins. Selection of a condenser is based upon water and ambient conditions at the location for the particular store, and upon past experience with previous installations in specific locations.

Many of the installations are being made with air-cooled condensers, but Collins says that his experience indicates some problems remain with the air-cooled type in the colder or extremely hot climates. For example, where exhaust fans are used with air-cooled condensing units problems are added in the form of extra maintenance, plus noise from the exhaust fans.

Where water is reasonably "good," plentiful, and not too expensive, some of the chain's stores will make use of water-cooled condensers with cooling towers. In some sizable installations, closed-circuit evaporative condenser systems have been used.

Maintenance, Service

On maintenance and service Safeway permits its individual stores to handle this on an individual basis. Practically all work is done by independent service contractors, and most of it is on a time-and-material basis.

"We tried a preventive maintenance program with our own personnel," Collins explains, "but we found it too expensive for whatever advantages it may offer. We found our biggest problem in this program to be the handling and direction of personnel."

Because Safeway's refrigeration and air conditioning equipment is maintained by independent contractors, his concern that such firms "keep up to date" on methods, procedures, and use of new service tools can readily be appreciated.

"It's primarily a process of continued learning," says the Safeway engineer. "The material written by Frank Versagi and the other information that you publish should be invaluable to all those who are in this kind of work. The contractor who will make progress is the one who makes use of all such sources of information."

Safeway Plans Expansion Of Distribution Center

DENVER—Plans for a $500,000 expansion of the $11 million Safeway Stores distribution center here include doubling the size of Safeway's frozen food warehouse.

R. L. Campbell, Denver division manager, said this part of the expansion program is an indication of the changing food business.

"Our frozen food warehouse was completely ample in 1954," he commented. "Now we need twice this space."

The expansion involves an addition to the produce warehouse and remodeling the interior to include 10 new banana rooms, cooler rooms, and other facilities at a cost of $225,000. The expansion of the frozen food warehouse will add 12,000 sq ft. Estimated cost is $175,000.

$65,000 Curling Ice Arena for Seattle

SEATTLE—Ground-breaking ceremonies were held recently for a $65,000 curling ice arena at 1444 N. 128th St. here.

The arena will be constructed for the Granite Curling Club. Club officials said the rink will be the first of its kind in the Pacific Northwest as a non-profit venture.

The building will accommodate five curling sheets of ice.

Refrigeration Engineering Co. will provide the ice-making machinery.

280 Ft of Meat Cases

IRVINGTON, N. J. — The Valley Fair Discount Center here features what is said to be one of the longest lineups of meat cases in the country—some 280 ft.

WATER COOLER
10 GALLON
PRESSURE TYPE

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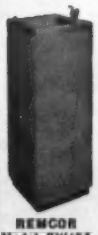
*To Dealers Only

Attractive • Sturdy • Economical • Stainless Steel Drain Top • Nickel Finished Copper Cooling Tank • ⅓ h.p. Tecumseh Hermetic Unit • Pre-Cooler • 5-Year Warranty on Refrigeration Cycle • Conforms to Government Specifications •



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Also 5 gallon Bottle Water Cooler—*$89.50

NOW YOU CAN SPECIFY —

INTERNAL PROTECTION

on all welded "4U" series hermetic motor-compressors provided by Copeland

New KLIXON Hermetic Protectors offer appliance makers a major product improvement.

For years refrigeration and air conditioning manufacturers have wanted to mount current and temperature sensitive protectors inside the compressor shell adjacent to the windings for improved temperature sensing, better motor protection, greater reliability.

Now, *for the first time,* it can be done! The new KLIXON Hermetic Protectors can be internally mounted because their hermetic sealing makes them freon-proof and airtight. Even though internally mounted they will not cause any changes in the refrigeration gas, nor oil contamination from contact arcing.

Extensively tested and inspected, KLIXONS offer long life, dependability and consistent performance. Specify internally mounted protectors on all your motor-compressor units — *you can promote them as a major improvement in your line!*

New COPELAWELD Motor-Compressor, manufactured by Copeland Refrigeration Corporation, Sidney, Ohio, features the advantages of internally-mounted KLIXON Hermetic Protector. Cutaway shows location of motor protector adjacent to motor windings.

Write for bulletin and detailed report on KLIXON *testing and quality assurance.*

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SPENCER PRODUCTS: Klixon® Inherent Overheat Motor Protectors • Motor Starting Relays • Thermostats • Precision Switches • Circuit Breakers

Air Conditioner Designed for Mobile Home

● A new mobile home air conditioner is now being marketed by Preway, Inc., Dept. AH&RN, Wisconsin Rapids, Wis.

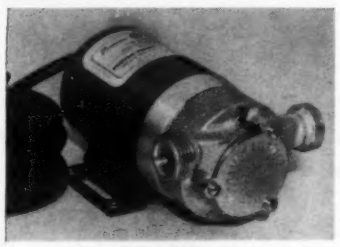
Tests conducted on the new unit, called the "Mark Zero," indicate the 23,000 Btu heat removal capacity is accomplished while maintaining temperatures of 80° inside the coach when the temperature is 95° outside, and with a 750 cfm air circulation, the company said.

One basic model is available at present, the model 1890 for top discharge. A side discharge model is planned for the near future.

Features include "a high powered delivery which is achieved by special motor and fan design, and a very rapid installation of the one-piece unit," it was stated. "High capacity gained through use of twin condenser fans contributes to the efficient performance of the conditioner. An important feature is the fact that the unit is completely hermetically sealed at the factory to insure tight, permanent connections within the unit.

"The unit can be used in connection with any make of furnace, although it is designed as a companion of the Preway Mark III oil and Mark VII gas furnaces."

Self-Primer Will Pump R-11 As Cleaner



● A "Pony" self-priming pump that can be employed to pump R-11 when used as a cleaning agent is being manufactured by Proven Pump Div., Western Brass Works, Dept. AH&RN, 1440 N. Spring St., Los Angeles 54.

The portable pump can also be used as a sump pump for condenser drains located below sewer level. It has a capacity in excess of 300 gph and will lift water by suction up to 15 ft. It weighs 5½ lbs and can be controlled by the usual float switches.

The pump, whose motor can be mounted high and dry out of the sump, is available in 115 v ac or in battery operated units of 6, 12, 24, and 32 v dc. Port connections are ¾ in. garden hose outside and ⅜ in. pipe thread inside.

New construction features include bronze body, stainless steel shaft, and choice of "Neoprene" or "Hycar" impellers.

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FLAPPERS for sealed units. Made of the finest Swedish spring steel—40 different flappers to fit most hermetic compressors.

COMPRESSOR GASKETS for sealed units. Precision die cut from sheet asbestos—Uniform thickness to insure original efficiency. Available for most hermetic compressors.

INSIDE REPLACEMENT TERMINALS for sealed units incorporates nylon and rubber packing. Terminal rods and nuts are heavily plated to resist the effects of moisture and acid — Packed 3 in a set.

SPUN COPPER STRAINERS for almost every type installation using strainers. Available with single or double capillary outlets and/or charging tees. Special strainers can be made to your specifications.

ALSO AVAILABLE

SEARCH the liquid leak detector—a special formula developed to pin-point the slightest leak by applying it to the suspicious area. Its high viscosity enables SEARCH to cling and wrap itself around the tube or fitting thus reaching all normally "hard to reach" areas. SEARCH is contained in an unbreakable squeeze type bottle with a self applicator.

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Instrument Indicates Phase Sequence

● A new, miniaturized pocket portable instrument for indicating phase sequence in three-phase power systems has been developed by Associated Research, Inc., Dept. AH&RN, 3777 W. Belmont Ave., Chicago 18, Il.

"Models 40A and 44A portable phase sequence indicators weigh but 11 oz each and are 37% smaller than the predecessor models 40 and 44," it was stated. "The new instruments are 2⅞ in. wide by 1⅝ in. deep and 4 in. high. They provide positive phase sequence indications that are essential during installation and maintenance on all electrical equipment operating from three-phase power. The instant reading not only assures proper rotation of motors but guards against costly damage.

"Model 40A is designed for 60-cycle power circuits and has a switch for adjustment to 120, 240, and 480 volts. The model 44A is for use on 400-cycle circuits."

Whirlpool Improves Refrigerators for '61

● Several improvements designed by Whirlpool in the recent past carry over to its new nine-model 1961 line of electric refrigerators, according to Whirlpool Corp., Dept. AH&RN, St. Joseph, Mich.

Features stressed are "the 'jet-cold-shelf,' quick-chilling foods placed on it; 'IceMagic,' automatically producing and ejecting into a 100-cube capacity storage bin unique, half-moon shaped ice cubes as needed; 'million-magnet' door seal; and 'constant-cold reserve,' restoring cold air the instant it is needed, usually after the door has been opened.

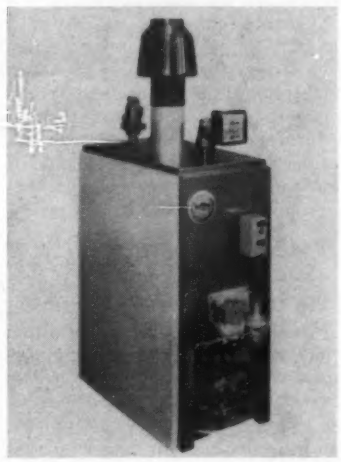
"Additional to these conveniences is 'no-frost,' a feature of five models in the line (three more than last year) which disposes of the need for defrosting.

"Flush hinges permit doors in all nine models to open full, even when units are installed between cabinets. Capacities in the new line range from 10.51 cu ft in the smallest unit (model HD-11) to 15.51 cu ft in the largest (model Mark 61)."

Whirlpool also is offering five upright and two chest-type freezers for 1961.

Chest freezers feature an improved defrost drain, blue decorator color top, a recessed aluminated door lift handle, and an all-porcelain liner. Supreme models in the upright freezer line offer a "Handi-Spense" door, and a swing out storage basket.

Federal Adds Smaller Cast Iron Boiler



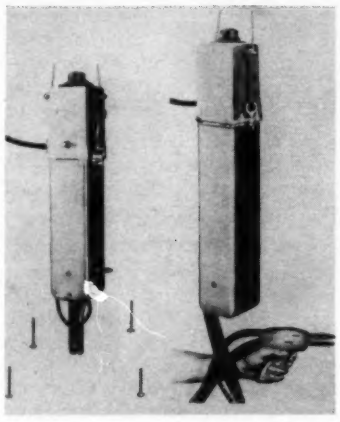
● The availability of a new boiler in its cast iron line has been announced by Federal Boiler Co., Dept. AH&RN, Midland Park, N. J.

The "Aqua-Mite," now the smallest of that line, stands 29¾ in. high and 22 in. deep. It is recommended for installation in smaller homes, service stations, detached garages, stores, and shops.

"In apartment buildings, Aqua-Mite boilers allow tenants to enjoy individual heat control with individual apartment heating systems," the company said. "The Aqua-Mite is approved by the American Gas Association for use with manufactured, natural, mixed, and LP gases. Natural gas inputs range from 50,000 to 90,000 Btu in three miniature sizes.

"The boiler is factory assembled with gas burned, controls, thermometer gauge, and ASME relief valve ready for use with any type of hydronic heating."

Spotter Welds Insulation Pin To Ductwork



● Spotting of insulation pins to ductwork can be accomplished with two new low-cost units developed and manufactured by Duro-Dyne Corp., Dept. AH&RN, Route 110, Farmingdale, N. Y.

PinSpotters are available in two models. Model PS-100 weighs 25 lbs and works on 110 volts. It can be carried to the work or suspended over the work area, making it especially useful for "on the job" as well as shop applications, the company said. The pins, called "Spotter Pins," are supplied in standard lengths from ¾ to 2½ in.

"To spot a pin," it was explained, "simply insert pin in electrode tip, depress unit against work, and press switch. Automatic timing assures uniform, secure welds. Works on light as well as heavy gauges of galvanized as well as uncoated steel.

"Model PS-200, a 220-volt unit, offers the added flexibility of a remote gun connected to the 30-lb power source by 5-ft cables.

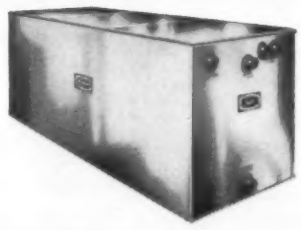
"After the pins are spotted, insulation is pressed over pins to ducts. "Spotter Clips" are then slipped over pins to secure insulation to duct. PinSpotters as well as pins and clips are available from Duro-Dyne distributors."

Humidifier Is No Larger Than Table Radio

● A new "Humi-Zon" humidifier has been introduced by the Pentron Sales Co., Inc., a wholly-owned subsidiary of Pentron Electronics Corp., Dept. AH&RN, 777 S. Tripp Ave., Chicago 24, Ill.

The humidifier, "no larger than a table radio," is portable. It retails for $29.95, the company said. It added that the unit is also an air purifier, with a washable fiberglass filter element in the rear.

LATENT HEAT STORAGE FOR AIR CONDITIONING



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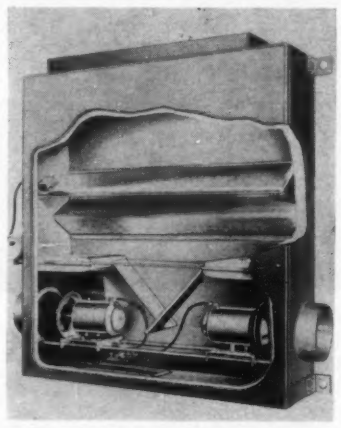
DEPENDABLE AIR CONDITIONING

DOLE THE Cel LINE

Simplify Acoustic Terminal Control Units



● Production of new acoustic terminal control units for all-air high-velocity systems has been announced by Carnes Corp., Dept. AH&RN, Verona, Wis.

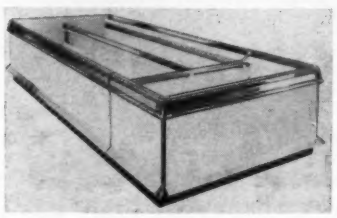
The units are available in three ceiling models and two window/perimeter models in three sizes.

Ceiling units can be had in the following types: end discharge, bottom discharge, and multi discharge.

The window/perimeter models —of front discharge and top discharge design—are provided with either the "Curtainaire," linear, or the modular diffusers. All Carnes models offer the option of single or dual duct, with full control selection.

The company said the new units "are designed to solve service problems by eliminating curtains, linkages, flappers, pulleys, sliding bases, bladders, cables, pivots, perforated follow-through plates, and split responsibility in servicing the units."

Add End Display for Dual-Isle Cases

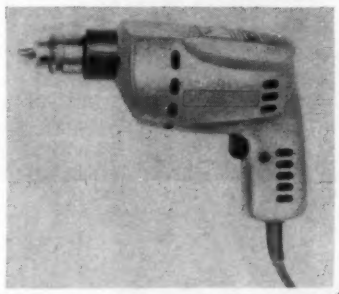


● The availability of a new, low temperature end display case for installation on the end of "Wide Dual-Isle" frozen food and ice cream cases has been announced by McCray Refrigerator Co., Inc., Dept. AH&RN, Kendallville, Ind.

"These ends will allow more facings, furnish additional display impact in little added floor space, and create much the same added impulse sales possibilities as an end of gondola display," it was stated. "Coming or going the customer makes contact with the whole display and can shop it from any of three sides.

"The new ends replace the conventional case ends and can be installed on one or both ends of a single case or line-up of cases. Each end is an individual refrigerated case and can be used to display either frozen foods or ice cream. They supply an additional 13.4 sq ft of display area and 16.7 cu ft of display volume in only 21.6 sq ft of floor space."

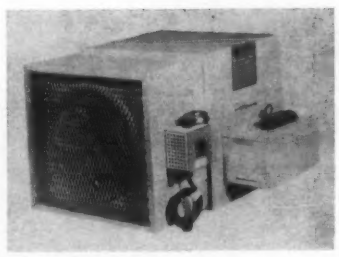
Strong, Light Safe-T-Drill Is Power Unit



● A new No. 1144 double-insulated ¼-in. "Safe-T-Drill" with nylon housing and insulated chuck has been introduced by Miller Falls Co., Dept. AH&RN, Greenfield, Mass.

Priced at $24.95, the drill is said to offer buyers greatly increased safety, high strength, and a considerable saving in weight.

In addition, the Safe-T-Drill serves as the power unit for a complete 14-tool power workshop with a motor rated at a full 2.7 amperes, the company stated. It drives attachments such as a 5½-in. circular saw, hedge trimmer, finish sander, portable and bench sabre saw, bench grinder, and bench sander. Several attachments incorporate a new Millers Falls on-and-off-in-seconds "Quik-Change" feature.



Portable Electronic Air Cleaner Bows

● A "high capacity" portable unit has been added to the line of electronic air cleaners manufactured by Trion, Inc., Dept. AHRN, McKees Rocks, Pa.

"Designated the Trion TFA, the new model is a commercial room unit that permits high efficiency electronic air cleaning in areas where lack of ductwork prevents installation of a centralized system," the company said. "Its versatility makes it particularly suitable for use in restaurants, cocktail lounges, hotels and motel meeting rooms, offices, or for any application when localized clean air is desirable.

"The Trion TFA has the capacity to clean the air in a 9,000-cu ft room with a complete air change every 10 minutes. In areas larger than 9,000 cu ft, multiple units may be used."

Liquid Organic Biocides Clean Cooling Water

● A new line of liquid organic biocide products for industrial cooling water has been announced by Dearborn Chemical Co., Dept. AH&RN, Merchandise Mart Plaza, Chicago 54, Ill.

"Although highly effective against harmful organism, the new products are quite low in toxicity to humans," the company stated. "They do not create dust or fumes, and have such a high flash point that fire hazards are minimized.

"These liquid biocides, which are readily soluble in all types of water, are easily fed into any industrial water systems. They are non-corrosive, and are compatible with sulfates, phosphates, chlorides, or carbonates in the water."

One of the products is designed for use in recirculating cooling water systems; another for application in open recirculating cooling water systems; a third is said to be effective against slime-forming and odor-producing bacteria in air wash and open recirculating cooling water systems; and a fourth is also an algaecide and is effective where both slime and algae are present in cooling towers, the company said.

Flux Sold In Plastic, Wide-Mouthed Jars

● Welding, brazing, and soldering fluxes manufactured by All-State Welding Alloys Co., Inc., Dept. AH&RN, White Plains, N. Y., are now packaged in unbreakable polyethylene plastic jars in ¼, ½, and 1-lb sizes.

"The wide-mouthed plastic flux jars will be used for all but the most reactive fluxes, it was pointed out. "The wide-mouthed feature allows rapid flux dipping and application."

Shure-Set Fastening Kit Performs 100 Jobs

● A new "Shure-Set" fastening kit for contractors and craftsmen is being introduced "at a special low price" by Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Dept. AH&RN, New Haven, Conn.

Designated model R-550, the kit contains one Shure-Set tool, one "Shure - Drive" shock - absorbing hammer, 50 drive pins, 50 threaded studs, and a deluxe metal carrying case. Introductory price is $29.95, $7.50 less than the total cost of the individual items, the company said.

With the Shure-Set kit, craftsmen can perform over 100 different fastening jobs, setting studs into thin steel or concrete with a couple of hammer blows, it was stated.

Air Dryer Protects Pneumatic Controls

● The development of a new, economy model non-cycling air dryer designed and engineered for the protection of pneumatic controls has been announced by Hankison Corp., Dept. AH&RN, College & Pike, Canonsburg, Pa.

With a rated capacity of 10 scfm at 100 psig, this Series-E unit is suited for air conditioning and ventilating control systems, printing press and other pneumatic feeds, processing and production lines, and many laboratory applications, according to the company.

The new unit drys air and gases by mechanical refrigeration. It is enclosed in a steel cabinet equipped for floor or wall mounting. It is available as a basic unit (no trap), model E-10; with the Hankison "Mag - Pneu - Power" automatic trap, model E-10T; or with the Armstrong #21 Trap, model E-10C. The unit measures 20⅛ in. high by 14 in. wide by 12 in. deep, and weighs approximately 60 lbs.

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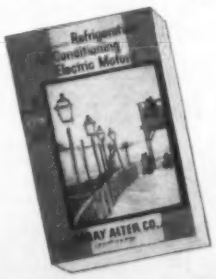

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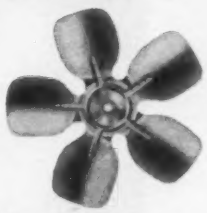

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Each Apartment In 60-Unit Project Has Central Heating, Cooling Averaging $960

A FURRED-DOWN ceiling conceals ducts carrying cool or warm air to rooms of this apartment in the Memorial Woods project, Houston, Texas. Each of the 60 units in the garden apartment project has its own cooling and heating system.

HOUSTON, Texas — An attractive 60-unit garden apartment project here "offers low cost central air conditioning for each apartment with systems which are ingeniously fitted into the informal architecture," according to Carrier Corp.

Clustered around a grassy court and an oval-shaped heated swimming pool, the Memorial Woods Apartments were built for visual appeal as well as comfort. Patios and shade trees blend with the architecture to create beauty while dishwashers, built-in vanities, washers, dryers, and year-round air conditioning provide comfort and convenience of the project's tenants.

"Each of the 18 single-bedroom and 42 double-bedroom units has its own central heating and cooling equipment which was installed at an average cost of $960 per apartment," it was pointed out. "The air conditioning systems supply 25% outside air to the interior and have easy-to-change filters located inside the cold air return grilles.

"The upstairs hallways have an unusual high ceiling which is actually the pitched roof of the building. Louvers at each end of the hallway open to the outdoors.

THIS UPSTAIRS HALLWAY is an important part of the air conditioning system. It has louvers at each end, opening to the outdoors. Skylights and crossbeams make the hall airy and light.

UPFLOW FURNACES by Carrier heat the downstairs units. They are housed in storage rooms like this one. Above the furnace is a 2-ton self-contained cooling unit.

"Each air conditioner for a second-floor apartment draws condenser air from the center hallway and discharges it into the attic where it leaves through large louvers.

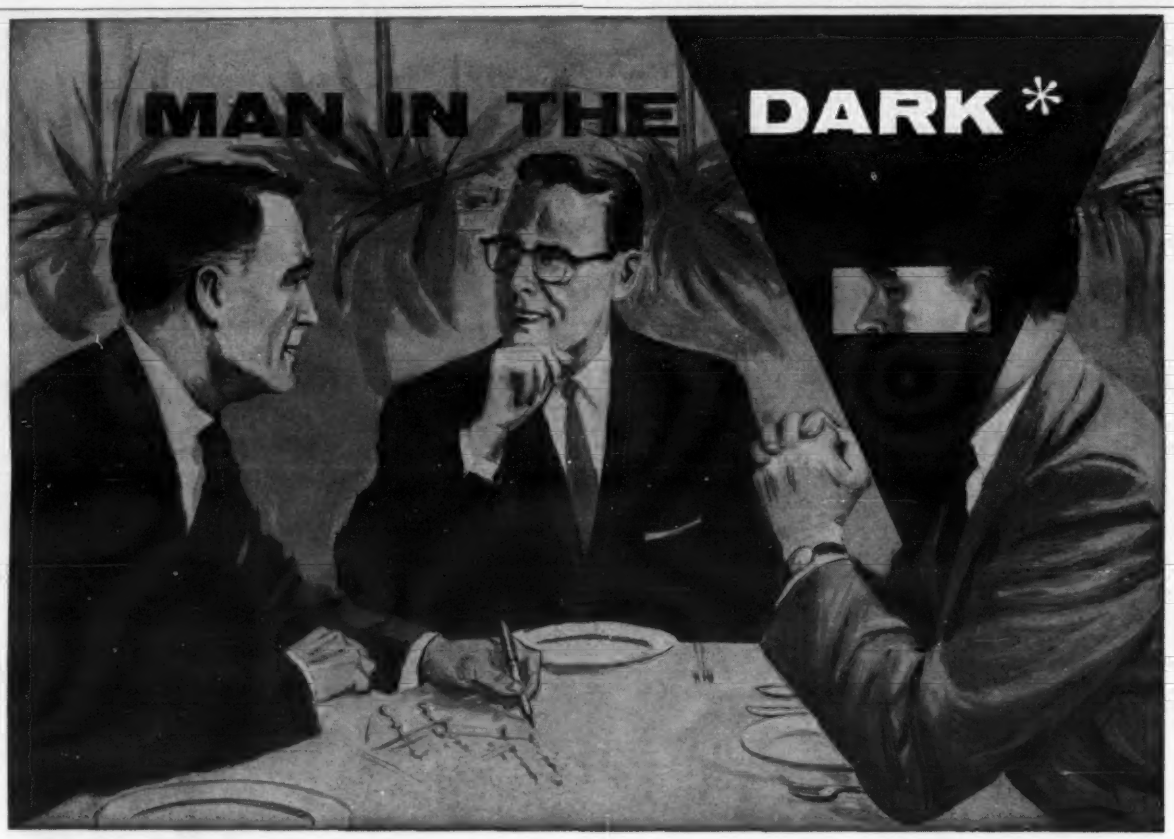
"Whenever the attic space becomes hot, auxiliary exhaust fans go on automatically to increase ventilation and reduce operating cost on the cooling cycle. Heating for the upstairs apartments is furnished by duct heaters.

"Downstairs apartments are heated by standard Carrier upflow furnaces located in small storage rooms at the rear of each apartment. A self-contained, air conditioner of 2-ton capacity projects through the outside wall of the storage room and fits flush with the exterior surface.

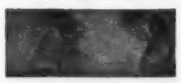
"Air is drawn from the apartment to the furnace, passes through the furnace to the cooling unit, and back into the ductwork for the apartment. Ducts run along a central hallway and are hidden by a furred-down ceiling."

The two-bedroom apartments have 1,000 sq ft of floor space and rent for $125 to $165 per month. Single-bedroom units rent for $95 to $125, it was pointed out.

William B. Hoff was the architect.



*"Why wasn't I aware of those facts?"



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Just so you won't be in the dark about which publication is best for *you*, we invite you to take a closer look at the NEWS. Your local Representative has data on reader preference, circulation growth, advertising lineage, editorial content and other important facts. See him soon; you'll be glad you did.

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ARI Presents Objectives for 1961--

(Continued from Page 1, Col. 5)

mittee to become the focal point for decisions and actions we hope to make and take during 1961 included:

Increased profitability for the entire industry through a greater awareness of our present position, now documented for 1958 and 1958 and soon to be documented for 1960.

Pursuit of revision of tax laws to offset the high cost of research and development; a highly desirable objective in the public interest as well as our own, if our national economy is to retain its vitality in the world community.

Discipline in the conduct of ARI affairs to accomplish our objectives at the lowest possible cost. We are the stewards of ARI funds.

Plan Promotion Of Industry's Benefits

The principal marketing objectives to be pursued by ARI in 1961 will be:

1. Dissemination of a maximum amount of statistical information in market trends within the industry, measured by shipment of products.

2. Promotion of the benefits of air conditioning and refrigeration as our industry competes with others, such as automobiles, travel, recreation, escalators, lighting, and so forth.

The engineering objectives that will be emphasized, as described by Serfass, include:

1. Continued relentless emphasis on standards which represent the industry consensus on product designs of acceptable quality.

2. Continued relentless emphasis on certification to assure achievement of quality design.

Finally, said the new ARI president, there are four general or administrative objectives which will be pursued diligently:

1. Encouragement of sections in their various projects.
2. Growth in membership.
3. Greater emphasis on refrigeration activities.
4. Development of trained installation and service personnel.

Serfass Outlines Aims Of Proposed Programs

"In appraising these specific objectives for 1961," said Serfass, "it is appropriate that some comments be made on the philosophy behind these objectives.

"First of all and above all else, we want a more profitable industry. Greater income and lower cost will both make their contributions.

"The financial objectives, the marketing objectives, and the engineering objectives are all vital ingredients in achieving greater income. The engineering objectives are equally vital in achieving lower costs.

"But there are other factors that are helpful in achieving lower costs. Every parasitical load on our industry must be watched and every effort made to reduce them or eliminate them. Taxes that retard research; taxes in the form of excise, unnecessary and undesirable or restrictive codes and regulations are just a few examples that require our continuing vigilance if we are to achieve low costs.

"Your officers are also mindful that the costs of a trade association are a cost to our industry that must be minimizied consistent with the services rendered.

"The second factor in the philosophy behind the specific objectives for 1961 is a continuing desire to render a greater service first of all to our membership; and second to America by utilizing air conditioning and refrigeration machinery to build better health and a finer industrial machine."

Augenstein Asks Some Questions on Plans

In a blunt but good-natured talk that developed a responsive audience, Paul Augenstein, Chrysler Airtemp president, and new chairman of ARI's planning committee, asked the questions—

"Are we perhaps just doing a lot of talking to ourselves?

"Are we giving enough consideration on how what we are doing stacks up with our wholesalers and retailers?

"Is enough being done to implement the announced additional emphasis that we say shall be given to refrigeration in the activities of ARI?

"Are we setting in motion some programs that will upgrade the industry's products in the minds of buying elements, and thus advance sales of the industry's products?

"Shouldn't we be taking a longer look at plans for our annual meeting, with a view to developing a larger and broader program, with more intensive discussion of industry problems?"

All the above are areas to which the ARI Planning Committee intends to devote attention in the coming year, Augenstein indicated.

In his address as the retiring president of ARI, Rudy Berg, Copeland Refrigeration Corp. vice president who held office for a year-and-a-half during the period when the internal structure of ARI was being reorganized, reported that adoption of new policies and procedures for the internal strengthening of the association had been accomplished generally in line with an established time-table.

(A complete report of the talk by Rudy Berg, because it details much of the plans, activities, and accomplishments of ARI, will be published in a following issue.)

Main elements of the internal reorganization included a new project-type budgeting and accounting process, and a requirement that ARI members manufacturing products within the scope of any ARI product-section must support the activities of such section. The transition to this type of operation had been accomplished in a generally smooth fashion, Berg stated.

The retiring president also reported on accomplishments in public relations, the statistical program, engineering projects including developments of standards and a test program to tie in with the certification program, and improved inter-association relations, reporting progress in all of these areas.

MEN WHO WILL GUIDE ARI through the association's activities in the coming year are (l. to r.) W. H. Aubrey, Frick Co., treasurer; F. J. Kreissl, Detroit Controls Div., American-Standard, vice president; Ray K. Serfass, Westinghouse Electric Corp., Air Conditioning Div., president; Rudy Berg, Copeland Refrigeration Corp., immediate past president; L. N. Hunter, Crane Co., Heating & Air Conditioning Div., vice president; Russell Gray, Carrier Corp., vice president.

Certification Program Continuing To Move

In other reports of ARI Section Activities that made news, progress was reported in the unitary air conditioner certification program. Unitary heat pumps will be certified under separate licensing agreements with the individual manufacturers, and if final agreement is reached on standards for testing and rating, the plan may possibly go into effect by March 1, 1961.

One of the Heat Transfer subsections is planning certification programs for room fan-coil air conditioners and for room air-induction units. The Water Cooler Section is committed to a program for drinking-water coolers. The Reciprocating Compressor and Condensing Units Section is examining the problem involved in, and the possibilities of, a certification program covering at least some portion of its products.

Revisions of standards looking toward possible inauguration of certification programs are under way in the Centrifugal Liquid-Chilling Packages Section, Sub-Section B of the Heat Transfer Section, Mobile Refrigeration Section, Reciprocating Liquid-Chilling Packages Section, and Valves, Driers, Fittings, and Accessories Section.

The testing phase in the Unitary Air Conditioners Certification Program is proceeding satisfactorily, it was reported, with some 31 units having been run through the exhaustive routine. All but six have passed—some of them with minor adjustments and changes.

"Changes are being made by the makers of these units and we expect that they, too, will be corrected to meet the capacities certified by their manufacturers, and the equipment performance requirements," said the report.

Unitary Conditioner Section Adds Plans

The Unitary Air Conditioner Section announced plans that it had set up a new executive committee which will meet at frequent intervals to develop a more intensified effort to meet the prime objective of the section, which Don Meckstroth, Westinghouse Air Conditioning Div. marketing manager and retiring chairman of the section, outlined to be:

1. Vigorous advancement and promotion of the certification program.

2. A training program designed primarily in its initial stages to familiarize young men with air conditioning and refrigeration and to give them basic knowledge of the mechanics of the industry, with the thought of attracting new personnel into the industry. One prototype school is already operating in Syracuse, N. Y., another is contemplated for Columbus, Ohio.

3. Development of plans to promote the industry's products to the ultimate consumer on a broad scale, using a variety of promotion and public relations methods.

(More detailed reports on the Unitary Air Conditioner Section meeting, and on the current status of the certification program, will be published in subsequent issues.)

New Officers, Directors

In addition to Serfass, officers include three vice presidents—Russell Gray, vice president of Carrier Corp., and L. N. Hunter, director of engineering for Crane Co.'s Plumbing, Heating & Air-Conditioning Group, both re-elected, and F. J. Kreissl, president, Detroit Controls Div. of American-Standard—and a treasurer, W. H. Aubrey, president of Frick Co., also re-elected.

The new ARI president has served as vice president and chairman of the institute's Planning Committee for the past year.

In addition to the officers, four new directors were named by ARI. They are:

Cecil Boling, president and treasurer of Dunham-Bush, Inc., Joseph B. Elliott, president, York Div., Borg-Warner Corp., both directors at large, and L. P. Benua, executive vice president, Ebco Mfg. Co., representing the Water Cooler Section, and J. G. Landrigan, general sales manager, United Wire & Supply Corp., representing the Tubular Products Section.

Single Contract--

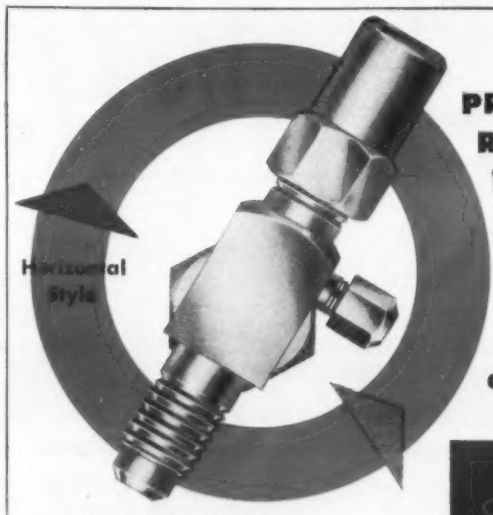
(Continued from Page 1, Col. 4)

3. It recommended that the Joint Industry Procedure for Handling Sub-Bids, said to favor the single contract system, be adopted by local AGC chapters in those areas where suitable plans are not already in effect and be submitted to AIA requesting cooperation of AIA local chapters to put this procedure or other workable procedures into effect.

AGC reportedly plans to distribute 40,000 copies of its single contract brochure to architects, engineers, Congressmen, and others to offset a booklet favoring separate mechanical contracts distributed to this same group by NAPC.

One general contractor reminded the board that the uncurbed practice of bid shopping and delayed payments to subcontractors was stimulating their interest in separate contracts.

He claimed the remedy lay in more subcontractor education.



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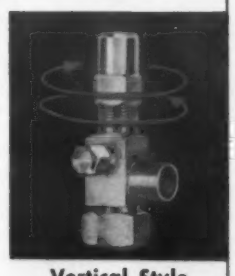

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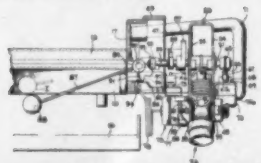
PATENTS

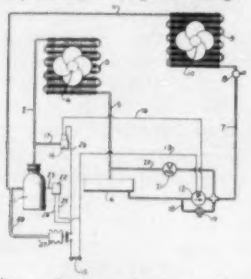
Week of Aug. 23 (Concluded)

2,949,749. AUTOMATIC ICE CUBE MAKER. Mullapudi M. Reddi, Chicago, Ill., assignor to The Dole Valve Co., a corporation of Illinois.



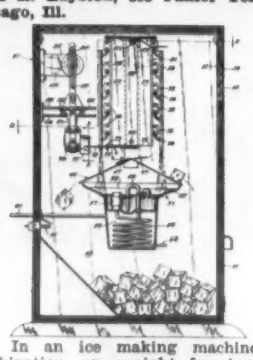
1. In an ice maker, an ice tray having ice molds therein, electrically energizable means for ejecting ice cubes from said molds, means energizing said electrically energizable means to initiate the ejection of ice cubes from said tray comprising a mold thermostat responsive to the temperature of the frozen ice cubes in said molds, a movable member operated by said thermostat upon freezing of the ice cubes in said tray to effect the energization of said electrically energizable means. . . .

2,949,750. HEAT EXCHANGE SYSTEM OF THE EVAPORATIVE TYPE WITH MEANS FOR MAINTAINING LIQUID SUPPLY LINE PRESSURE. Daniel E. Kramer, Trenton, N. J., assignor to Mercer Engineering Co., Trenton, N. J., a co-partnership.



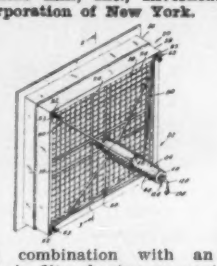
1. In a heat exchange system of the evaporative type having a circuit for refrigerant flow including cycling compressor, condenser, receiver, refrigerant pressure reducing device, and evaporator, all operatively interconnected by conduits, positively driven means in the conduit between receiver and pressure reducing device for forcing refrigerant to the said pressure reducing device for forcing refrigerant to the said pressure reducing device during on-cycles of the compressor whenever condenser pressure falls below a predetermined degree, and means automatically controlled by the condenser pressure for activating and deactivating said positively driven means. . . .

2,949,752. ICE MAKING MACHINE. John R. Bayston, 806 Junior Terrace, Chicago, Ill.



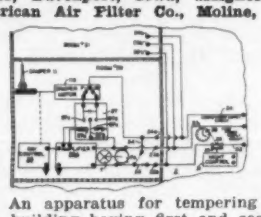
1. In an ice making machine, in combination, an upright freezing cell of height greatly exceeding its thickness, with an open bottom, at least one water inlet port and a plurality of water outlet ports vertically spaced with respect to each other in an unrefrigerated cell wall with means for supplying refrigerant to said cell under relatively low pressure to cool the cells and freeze an upright bar of ice therein, means for supplying refrigerant to said chamber under substantially higher pressure to free the ice therefrom. . . .

2,949,976. ACTUATING AND CONTROLLING MEANS FOR EXPANSIBLE FILTERS. William A. Tuthill, Westhampton Beach, N. Y., assignor to Flanders Mill, Inc., Riverhead, N. Y., a corporation of New York.



16. In combination with an expansible air filter having an upstream side face and a downstream side face, an expansion controlling means operatively coupled with such filter for regulating the expansion of said filter, electrical means coupled with said expansion controlling means for operating to actuate said expansion controlling means, and pressure sensitive actuating means coupled with said electrical means for energizing said electrical means when the air pressure on said upstream side face and at a second location provides a predetermined pressure differential to thereby cause said expansion controlling means to be actuated and said filter to be expanded in a direction substantially normal to one of the side faces of said filter. . . .

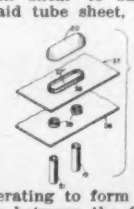
2,950,056. UNIT VENTILATOR HAVING CONTROL AND DAMPER CIRCUITS DESIGNED FOR CONNECTION TO DIFFERENT POWER SUPPLY CIRCUITS AND A SYSTEM OF SUCH VENTILATORS. Forrest G. Baker, Davenport, Iowa, assignor to American Air Filter Co., Moline, Ill.



1. An apparatus for tempering air in a building having first and second electrical power supply circuits, comprising: a unit ventilator having motorized-fan and day control designed normally to be connected to and energized by said first circuit with the motorized fan operating continuously to discharge a fan-induced flow of air into the room and the day control operating to signal for more fresh air upon a rise and for more hot air upon a fall in the temperature of said room from a predetermined value, motorized damper means arranged for selective connection one way to said second circuit to displace a damper in a direction to increase the relative amount of fresh air and another way to displace said damper in a direction to increase the relative amount of room air in said fan-induced flow and signal responsive means operating. . . .

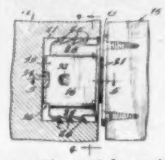
2,950,092. HEAT EXCHANGE CONSTRUCTION. Carmen A. Di Niro, Syracuse, N. Y., assignor to Carrier Corp., Syracuse, N. Y.

1. A tube sheet assembly for a heat exchanger comprising a tube sheet having a plurality of first apertures therein, a cap sheet bonded in face to face contact with said tube sheet, a second aperture in said cap sheet, an upstanding flange on said cap sheet bordering said second aperture, said upstanding flange surrounding said first apertures, and a return cap bonded in shear to said upstanding flange, said tube sheet, cap sheet and



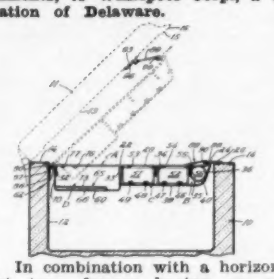
cap cooperating to form a sealed fluid flow path between the first apertures.

2,950,140. MAGNETIC DOOR LATCH. Roy A. Stone, Rockford, Ill. assignor to National Lock Co., Rockford, Ill., a corporation of Delaware.



2. A magnetic catch unit adapted to be mounted in a bore of a support for magnetically coupling the catch to a strike plate on a door for retaining the door closed, said unit comprising a casing of substantially rectangular cross section having an inturned extension at its opposite ends, a pair of spaced pole pieces and a magnet therebetween all housed within the casing but with one end of the pole pieces projecting beyond the adjacent end of the magnet. . . .

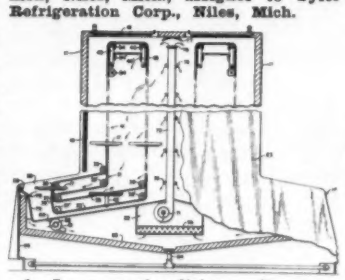
2,950,157. FREEZER CABINET SHELVING. Edmund J. Buzicky, St. Paul, Minn., assignor, by mesne assignments, to Whirlpool Corp., a corporation of Delaware.



7. In combination with a horizontal chest type freezer having an open topped body and a lid hingedly connected to the rear wall of said body, a rack body, pivot means pivotally connecting said rack body to said open topped freezer body along an axis parallel to the lid hinge axis at a point on the rack body nearer the rear wall of the freezer body than the front wall thereof, and projecting means on said rack body for overlying upper edge of the forward wall of said freezer body, thereby limiting the down pivotal movement of the forward end of the rack body. . . .

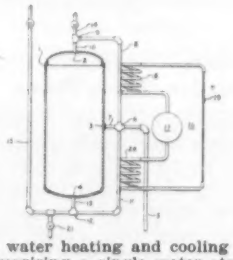
Week of Aug. 30

2,950,605. REFRIGERATED MERCHANDISING UNIT. Joseph B. Hennion, Niles, Mich., assignor to Tyler Refrigeration Corp., Niles, Mich.



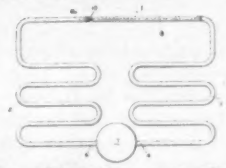
1. In a merchandising unit a casing comprising, a base having a front wall, an upper hollow column disposed above said base and having a front wall extending upwardly rearwardly of the front wall of said base, first opening means for said upper hollow column providing access thereto, second opening means disposed below said first opening means and between the upper edge of said front wall of said base and the lower edge of said front wall of said column. . . .

2,950,607. WATER HEATING AND COOLING SYSTEM. John H. Fries, Jr., Louisville, Ky., assignor to General Electric Co., a corporation of New York.



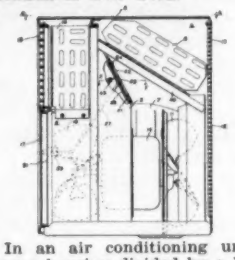
1. A water heating and cooling system comprising a single water storage tank, a water inlet line connected to an opening in a side wall of the tank, and a heat pump including a condenser in heat transfer relation with hot water stored in the upper portion of said tank above said opening and an evaporator in heat transfer relation with cold water stored in the lower portion of said tank below said opening, the evaporator serving to extract the heat from the inlet water at supply line temperature being delivered to the cold water circulating in the bottom of the tank. . . .

2,950,608. REFRIGERATION SYSTEM. Roy W. Abbott, Jefferstown, Ky., assignor to General Electric Co., a corporation of New York.



1. A refrigeration apparatus including in combination a compressor, a condenser and an evaporator formed from a continuous length of refrigerant conduit having opposite ends thereof connected in refrigerant flow relationship with said compressor, and restriction means in said conduit between said condenser and said evaporator comprising a capillary tube mounted entirely within said refrigerant conduit, a substantially cylindrical-shaped plug surrounding said capillary tube and connected in sealing relationship with the outer circumference of said capillary tube. . . .

2,950,667. ROOM AIR CONDITIONER HAVING VENT CONTROL MEANS. Stanley E. Rose, Lyndon, Ky., and Elmer E. Heimo, Erie, Pa., assignors to General Electric Co., a corporation of New York.

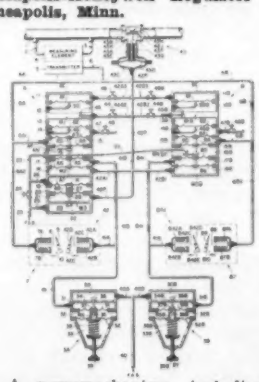


1. In an air conditioning unit including a housing divided by a barrier into inner and outer compartments, the combination comprising an aperture in said barrier for permitting the flow of air from one compartment to the other, a damper positioned across said aperture, hinge means along one edge of said aperture of said barrier for pivotally connecting said damper across said aperture for controlling the flow of air therethrough, said housing having a vertical slot in the front thereof, said vertical slot being horizontally offset from a position directly in front of said aperture in said barrier. . . .

2,950,728. FLAPPER VALVE. Robert B. Watrous, Philadelphia, Pa., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

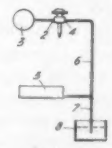
1. A motion amplifying flapper valve structure operative to variably throttle a fluid flowing from the bleed nozzle of a pressure chamber to alter the magnitude of the pressure of said fluid within said chamber, comprising a single thin flat plate of resilient material and means for applying pressure directly to one end portion of said plate while the other end portion is positioned for pivoting in a stationary block to thereby bow the entire plate and move its central portion transversely to a plane including said end portions. . . .

2,950,729. CONTROLLER. Harry J. Hartz, Philadelphia, Pa., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.



1. A servomechanism, including, a measuring element sensing variations in a measured variable, a transmitter actuated by said measuring element, a pair of controllers each having means operable by said transmitter to vary a supply of power in the sense opposite to the sense in which said supply of power is varied by the other controller. . . .

2,950,730. VACUUM CONTROL VALVE DEVICE. Sven Alvar Svensson, Johanneshov, near Stockholm, Sweden, assignor to Ingeniorsfirman Fliesberg AB, Stockholm, Sweden, a corporation of Sweden.



1. A valve device for maintaining vacuum in an apparatus at a constant negative pressure value comprising a valve housing having one side connected to said apparatus, first balanced valve means in said housing for controlling the passage therethrough, second valve means adapted to operate when the first valve means is closed for controlling the passage of fresh air to said one side of said valve housing, pressure responsive means for controlling both said valve means in response to the vacuum prevailing in said apparatus, and a conduit connecting said pressure responsive means with said one side of said valve housing, the opening of said conduit being located remote from said second valve means. . . .

(Continued on next page)

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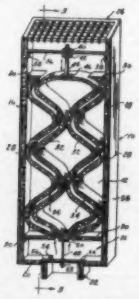
PATENTS

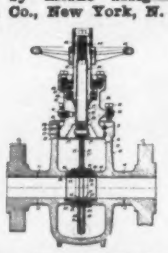
(Continued from preceding page)

2,950,776. VENTILATING AIR DISCHARGE MUFFLER. Joseph F. Stephens, Kansas City, Mo., assignor to Gustin-Bacon Mfg. Co., Kansas City, Mo., a corporation of Missouri.



1. Apparatus for feeding air from a supply duct to an area to be supplied with said air including in combination means forming a plenum chamber having an inlet for admitting air from said duct to said chamber to permit admitted air to expand and having an outlet to said area, means forming a pair of first baffle walls having sinuous surface configurations, means mounting said first baffle wall forming means in said chamber between said inlet and said outlet. . . .

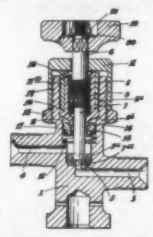
2,950,897. VALVE CONSTRUCTION. Austin U. Bryant, Walnut Creek, Calif., assignor, by mesne assignments, to Walworth Co., New York, N. Y.



1. In a valve construction, a body providing flow passages and a space between said passages, a valve member movable in said space between open and closed positions for controlling the flow of fluid through said passages, a pair of resilient seal rings of the O-ring type disposed on opposite sides of the valve member and arranged to generally embrace said passages, and mounting means for each of said O-rings, each of said mounting means forming a continuous annular recess for accommodating the associated O-ring. . . .

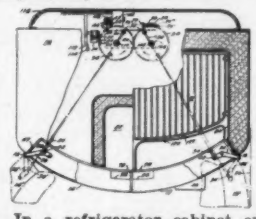
2,950,898. CONTROL VALVE. Waldemar Emil Voss, Kenton, England, assignor, by mesne assignments, to L. Adams Ltd., London, England.

1. A control valve device comprising a valve body having a bore of relatively small diameter and a counterbore of relatively large diameter providing a shoulder between said bore and said counterbore; inlet and outlet passages communicable with said bore; a valve seat in said body between said passages for controlling communication of said passages through said bore; an internally threaded gland member in said valve



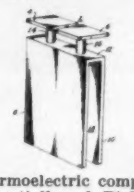
body, the major part of said gland member being within said counterbore with its outer surface spaced inwardly from said counterbore. . . .

2,950,911. REFRIGERATOR DOORS AND ACTUATING MECHANISM. Glenn Muffly, 1541 Crestview Dr., Springfield 32, Ohio.



1. In a refrigerator cabinet enclosing a storage compartment, means forming an opening through an outer wall of said cabinet for access to said compartment, a door for closing said opening, power transmission means for actuating said door, said transmission means including a yieldable drive in the direction of closing the door and a relatively positive drive in the direction of opening the door, and means for actuating said transmission means to move the door and to stop at the position which normally represents completion of door movement in either direction. . . .

2,951,105. THERMOELECTRIC COMPOSITIONS AND ELEMENTS AND DEVICES USING THEM. Charles J. Busanovich, Princeton, N. J., assignor to Radio Corp. of America, a corporation of Delaware.

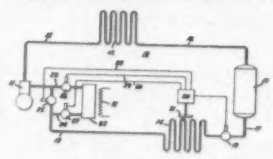


1. A thermoelectric composition consisting essentially of Bi_2Te_3 and, on the basis of the total weight of said Bi_2Te_3, including in addition:

	Percent
Bismuth	0.10 to 0.50
Antimony	0.27 to 0.80
Copper	0.13 to 0.40

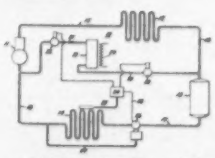
Week of Sept. 6

2,951,349. VARIABLE CAPACITY REFRIGERATION SYSTEM. Theodore L. Etherington, Burnt Hills, N. Y., assignor to General Electric Co.



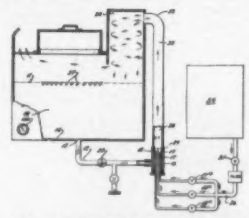
1. A variable capacity refrigeration system, a plurality of refrigerants flowing through said system, a sorption vessel in said system, said sorption vessel containing a molecular sieve adsorber, and means to admit the flow of refrigerant mixture into said vessel for said adsorber to selectively adsorb and desorb one of said refrigerants from and into the system. . . .

2,951,350. VARIABLE CAPACITY REFRIGERATION. Theodore L. Etherington, Burnt Hills, and Peter Cannon, Scotia, N. Y., assignors to General Electric Co.



1. A variable capacity refrigeration system, a plurality of refrigerants flowing through said system, a sorption vessel in said system, said sorption vessel containing a modified molecular sieve adsorber said sieve modified by having preadsorbed CCl_2F_2 thereon, and means to admit the flow of refrigerant mixture into said vessel for said adsorber to selectively adsorb and desorb one of said refrigerants from and into the system. . . .

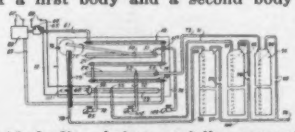
2,951,351. CONTROLLED CHILLING AT AN ACCELERATING RATE. Charles D. Snelling, R.D. #1, Breinigsville, Pa.



1. In combination, a freezing tank, a refrigerant in said tank at atmospheric pressure, a nozzle having a plurality of valve-controlled jets, a withdrawal passageway leading from the tank to the nozzle, means for discharging a liquefied gas under pressure to the nozzle, a return pipe leading from the nozzle upwardly to a point above the tank and forming a gas lift to return the refrigerant to the tank, and means controlled by the temperature of the refrigerant in the tank for opening the valves. . . .

2,951,352. COOLING DEVICES. Ralph A. Nicholson, Brady, Texas, assignor to Intercontinental Mfg. Co., Inc., Garland, Texas.

1. A liquid cooling device comprising a container, a plurality of heat conductive bodies disposed in said container and spaced laterally from one another, each of said bodies having an elongate passage, at least the passages of a first body and a second body of



said bodies being serially connected whereby a refrigerating fluid may be circulated through the passageway of said first body and then through the passageway of said second body, a third body of said bodies being disposed between said first body and said second body and its passage being for the circulation of first liquid to be cooled to a predetermined temperature. . . .

(To Be Continued)

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

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MANUFACTURERS' REPRESENTATIVES for residential and small commercial year-round air conditioning. Twenty-five year old company. Factory southern location. Many desirable territories open. Give details — your present territories, lines, references. BOX A6633, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION INSTALLATION and service mechanic qualified on ammonia and Freon (mostly ammonia). Must be capable of taking charge on larger installations. Steady work and good pay for a qualified mechanic. Location Miami, Florida. BOX A6666, Air Conditioning, Heating & Refrigeration News.

FIELD SERVICE engineer—Our company is growing and expanding. We need and have opportunity for a capable, experienced, refrigeration service man, under 40 years to handle field service engineer responsibilities in limited territories in the Northeast, Midwest and West Coast area. Must be free to travel. Food store experience preferred. Willing to move at our expense, if necessary. High school (or better) education. Give full details, with five references, and send photograph with first letter. Applications without photographs will not be considered. Salary, expenses, insurance, welfare, and other benefits. BOX A6670, Air Conditioning, Heating & Refrigeration News.

MANUFACTURERS' REPRESENTATIVES. Air conditioning and heat pump manufacturer expanding to nationwide distribution desires full particulars and resume with first letter. Many choice territories available immediately. All replies confidential. Reply to BOX A6673, Air Conditioning, Heating & Refrigeration News.

SALES REPRESENTATIVES calling directly on trade accounts wanted by furnace and air conditioner manufacturer. Complete line oil, gas, electric furnaces and air-cooled split-system air conditioners. Territory available in Midwest, East, Southeast and Southwest. Give details as to experience, territory, other lines handled. Replies held in confidence. BOX A6674, Air Conditioning, Heating & Refrigeration News.

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I-B-R Stresses Need for Unity--

(Continued from Page 1, Col. 1)

an accelerated rate."

Ferry cited statistics which indicated that hydronic systems are on the upsurge. The first six months' figures for 1960 compared to 1958 showed boilers up 16%. Despite the drop in housing starts during 1960, boiler shipments during the first eight months were practically even with a comparable period of 1959.

Other I-B-R staff members reported on the various projects in the institute.

Hilda Eisenhardt, assistant general manager, in a speech entitled, "Building the Future of the Hydronics Industry through Education," gave facts regarding the record of I-B-R's accomplishments, both as applied to publications and the I-B-R school.

At the present time I-B-R is working on a new guide on snow melting and a revision of Guide C-30 (heat gain). A new edition of I-B-R Baseboard Ratings approved through Sept. 15 will shortly be off the press. A new edition of I-B-R Boiler Ratings will also be issued in the next few months.

240 I-B-R Schools Have Been Held In 102 Cities

Two hundred and forty I-B-R schools have been held to date in 102 cities with a total attendance of 13,676. In the last three years, the average attendance has been considerably higher than in previous years, 72 compared to 53. Twenty schools are scheduled to be held from January through June, 1961.

Arthur Wales, field training director, reported to the membership on the meetings which he is conducting in 20 areas where I-B-R schools will be held, for representatives of the I-B-R membership.

Aim is to give the men in the field a better understanding of I-B-R's objectives and projects, as well as lay plans for the promotion of the I-B-R schools.

Report on Rating Program

Another major activity of the institute is its rating program. John Woodworth, administrative assistant, stated that there are presently I-B-R ratings on cast iron boilers for 263 series, with four additional series now being processed.

I-W-H Water Heater Ratings have been issued on 36 heaters in boilers. Two additional submittals are in process.

The new booklet containing I-B-R Baseboard Ratings will show 113 units approved through Sept. 15. There are presently 91 finned tube units, involving 871 ratings, which have I-B-R approval.

The I-B-R Laboratory, of which Glenn R. Sward is the chief engineer, is used to test and check test both baseboard and finned tube units.

Sward gave a progress report on investigations affecting finned tube radiation, for which the results are not yet available.

Other projects on which I-B-R is working in cooperation with other associations are: testing and rating of fan coil units and uniform heat gain factors.

As previously reported in the NEWS, Prof. Warren S. Harris of the University of Illinois, who has been in charge of I-B-R Research since its inception in 1950, presented a report to the membership on the results obtained in the I-B-R Hydronic Research House this summer, using a valance system, designed for both heating and cooling. Heating performance will be studied this winter.

Speakers from other segments of the industry were:

J. O. Hendrickson, executive secretary of the National Association of Plumbing Contractors, stated that it has been the recent policy of his organization to more actively promote the hydronic industry.

To this end, his association is working closely with I-B-R to assist in promoting the educational activities of I-B-R, especially the schools, and to lend assistance in any way possible on other projects of mutual interest.

Gordon J. Andrew of the W. T. Andrew Co. of Detroit emphasized the importance of the wholesaler to the manufacturer and urged that the wholesaler be considered an important sales arm of the manufacturer.

The activities of the Better Heating-Cooling Council to promote the hydronics industry were summarized by Franklin Greene, executive director.

The aims and objectives of the Plumbing-Heating-Cooling Information Bureau were explained by Jos. R. Schmitt, executive director.

"How to Tell What You Know" was the subject of Dr. Arthur Secord, educator and lecturer.

John E. Reed, vice chairman of the institute, expressed his views regarding the future of the hydronics industry.

He emphasized the importance of the role of consulting engineers in the market for large construction projects.

In viewing the residential market, where baseboards have played an important part in increasing the demand for hydronic systems, Reed stated that the immediate problem facing I-B-R and BHC is to do everything possible to capture a larger portion of the home heating market.

He advocated an I-B-R campaign to keep salesmen and manufacturers' agents constantly informed of the progress of I-B-R programs.

I-B-R staff and officers are: John I. Woodworth, administrative assistant; Hilda Eisenhardt, assistant general manager; Arthur Wales, field training director; Daniel J. Quinn, chairman; Robert E. Ferry, general manager; John E. Reed, vice chairman.

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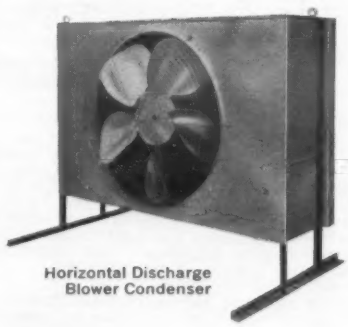
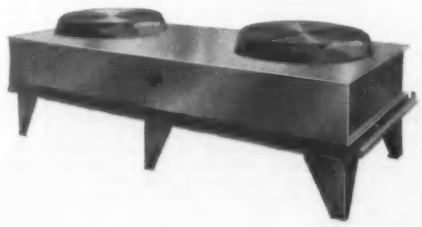
Other major features of both horizontal and vertical discharge units include a high efficiency Inner-Fin condenser coil with less internal volume and therefore smaller refrigerant charge . . . aluminum casing . . . and weather protected motor specifically designed for outdoor use. Both types of units are available with a variety of circuits to service more than one compressor.

For further information, request Form No. 7011B, or call the Dunham-Bush sales engineer near you.



Horizontal Discharge Blower Condenser

Vertical Discharge 'LSBC' Blower Condenser



DUNHAM-BUSH

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WEST HARTFORD 10, CONNECTICUT, U. S. A.

SALES OFFICES LOCATED IN PRINCIPAL CITIES